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Therapeutic and Preventive Medicine.

ARTERIOSCLEROSIS, WITH SPECIAL REFERENCE TO DIET.*

BY LOUIS FAUGÈRES BISHOP, A.M, M.D., NEW YORK,

Clinical Professor of Heart and Circulatory Diseases, Fordham University School of Medicine; Physician to the Lincoln Hospital.

Mr. President and Gentlemen of the Lynn Medical Fraternity:—

I AM highly appreciative of the opportunity of addressing you on a subject that I have found of the profoundest interest.

Everyone hears very often the term, "arteriosclerosis," but I doubt if many have a clear conception of what is meant when this word is used. The word itself of course means hardening of the blood vessels, but the blood vessels constitute a very important and extensive part of the human body. If you have ever seen one of those anatomical preparations in a museum that have been made by injecting the blood vessels with plaster of paris or some other insoluble material and then putting the part in solution of acid so that all the flesh was eaten away, and the only thing left was the plaster outlining in the blood vessels, you noticed that the blood vessels constituted a very large part of the anatomical structures. Indeed, when you come to consider the capillaries as part of the circulatory apparatus, they constitute, not only a large part, but a large proportion of the structures of the body.

Though the term "arteriosclerosis," if confined to the blood vessels, would still constitute a very extensive disorder, nevertheless, in clinical medicine it is used to name a disease that is much more extensive than merely the circulatory organs. It is used as a general term to define the degenerative disease in which the blood vessels take a conspicuous part.

The usual cause of this disease is a disturbance of the functions of nutrition, defined also as a disturbance of metabolism, so working back from the name, which is given to the disease because of the conspicuous participation of the large arteries, to the early cause of this condition, we find that arteriosclerosis may be defined as a disease dependent upon a disturbance of metabolism, resulting in thickening of the blood vessels.

It is easy enough for the man who is writing a dictionary to define arteriosclerosis as a thickening of the blood vessels. It is a very different matter to define the actual disease to which we give this name.

The fact is that no one has so far given a satisfactory definition of the disease arteriosclerosis.

It certainly is not merely thickening of the blood vessels, and anyone who stops, after having defined it in his own mind as a structural change in the blood vessels, will not get very far in treating people who suffer from this disease.

The disease is primarily a disturbance of function, and the true pathology of arteriosclero-

* Paper read to the Lynn Medical Fraternity, Lynn, Mass., January 18, 1917.

sis is a moving pathology, that is, a pathology which is all the time changing.

The man with fully developed arteriosclerosis is easy enough to recognize. He is usually a ruddy individual with often prominent temporal arteries, a particularly shiny eye, and all the appearance to the untrained observer, of excellent health. But if you talk to him, you find that he has been rejected by a life insurance company, or that he has noticed some discomfort in his chest when he moves about after a full meal. You will find that he has been a great eater of many varieties of food, or that he has been subjected a few years before to some very severe illness, some great nervous strain or some definite attack of food poisoning.

On examination you find his heart hypertrophied, his blood pressure elevated, and the kidney secretion showing a trace of albumen and a few casts.

Thus you have a picture that is duplicated in many individuals over forty years of age who are destined, if not taken care of, to die in the fifties or the early sixties. When they die it will be said that they died of heart disease or kidney disease, or lately—since the term has become popular—of "arteriosclerosis."

As a matter of fact they did not die of any of these things. They died of the end result of the habitual change in the physiology of the cells of the body. In other words, they died because the process of nutrition of the individual cells has failed through a disturbance of the relationship of these cells to the food materials by which they ought to be nourished and which ought to supply the fuel for their activities.

The medicine of a hundred years ago gradually became founded upon a special consideration of structural changes that were found in the bodies of people who had suffered from particular diseases. Pathologic anatomy was the banner around which nearly all serious workers in medicine rallied. When the physician had been able to define to his pupils, to his fellow practitioners or in his own mind, the exact structural condition of the organs of the sick person before him, he believed that he had accomplished a task that was more or less complete.

During the past thirty years there has grown up a school of medicine that has paid great attention to function, and has based its opinion upon modifications of function, changes in the chemical processes of the body, and in the habitual attitude of the cells toward outside materials which come in contact with the cells as food or in the form of some invading micro-organisms.

As far as treatment is concerned, this is much more fruitful and helpful than a mere determination of pathologic anatomy.

When we think only of a sclerosing organ it does not hold out very much hope to us that we may be able to do anything for the person who is the possessor of that organ, but when we regard the sclerosing organ as simply the end result of a process that is still going on and which we can detect and arrest, and when we consider the great and wonderful process of compensation, by which additional strength is given to one organ to compensate for another, or one part of an organ to compensate for loss of strength in another part, we have a new outlook that is extremely promising. The main function of medicine is the making of the sick person well. Curing the sick does not necessarily imply making them sound. That is often not possible, and it is not at all necessary. What is necessary is to balance up the damaged organs with compensating forces and side-track the underlying cause of the original injury.

Thus a man with arteriosclerosis, feeling pain in his chest every time that he moves, suffering from a blood pressure that is so high as to be a danger to life, with kidneys that are unable to perform their functions, can by proper diet, exercise, and attention to the state of his intestinal canal, be so improved that he will present all the appearances of health, perform all labor that can be reasonably required of a man of his age, and can live out the period of his expectation of life as laid down by the insurance tables. That is all one could ask.

So long as disease is defined as the dictionary defines arteriosclerosis, as merely a structural change, there can be no hopeful attitude toward degenerative disease.

This is possible only when we define this degenerative condition, which carries off a large part of those who survive to middle life, as a disease consisting of a change in function, or a disturbance of metabolism.

This word "metabolism" is so good a word that it is worth while to have a clear understanding of what we mean by it. In popular language the field of metabolism is covered by the word, "digestion," but in medical parlance digestion is rather limited to the processes of the stomach or the stomach and the intestines. Metabolism takes in the digestion in the mouth, stomach and intestines, but it takes in a good deal more. It takes in the chemical processes involved in the absorption of food from the intestinal tract by the body, the changes which take place in this food supply by the activities of ductless glands and of the organs that have ducts, and those processes by which the individual cell takes up from its surrounding blood plasma the food materials that it needs for its nourishment and converts them to its own use.

So you see there are in fact two digestions: There is the digestion of food in the intestinal tract, and then there is the digestion of food by the individual cells.

The logical conclusion of all this discussion is, that in the disease—known to the world as "arteriosclerosis"—*diet is of very great importance.*

The diet of arteriosclerosis has been, and is still, a matter of much discussion by writers on

dietetics. In reading from year to year what has come along on this matter of dietetics, it seems to me that there is a great lack of certainty in dietetic teaching. There are many books on dietetics that do not teach anything practical. They are loaded down with tables of food values—with classification of foods. Some of them enter into the naming of a great variety of different proteins, and there is an attempt to lay down a different dietary for every known disease.

It seems to me that most writers on dietetics have started at the wrong end. They have started at the food end and worked toward the person, while they should have started with the individual and worked back toward the food.

In other words, the question is not whether food is good food, or has a certain food value or what its qualities are, so much as whether it is the right food for the one who has to live on it. It would therefore seem that the proper study of dietetics in disease depends upon a study not so much of the food as upon the reaction of the patient to the food.

We know very well that diabetics are idiosyncratic against sugar. We know that gouty people are idiosyncratic against a meat diet. We know that there are certain people who are habitually unable to deal with certain particular foods. Almost anyone can recall some friend or relative who is made definitely ill by some article of food. The person is idiosyncratic to it.

This disturbance of metabolism that is responsible for the degeneration of the human body, leads to death from a disease that may be defined one way or another, but consists practically of an acquired food idiosyncrasy. Much of this danger can be avoided by observations to discover as early as possible when people have acquired such idiosyncrasies. When these are found, until it is proved that the idiosyncrasies have disappeared, the harmful food must be avoided.

This theory, placing arteriosclerosis as an end result of a disturbance of metabolism, consisting in the large proportion of instances of acquired food idiosyncrasies, is one that I have taught for a long while and is accepted by a certain number of people. A good many persons have never heard of it because the part that any one man plays in the large field of medical literature is very small. Some have definitely rejected it, but many have accepted it, so it is necessary to keep on talking about it, until better light appears.

The main point is that it is a helpful theory. It is so easily demonstrated that people with the severer types of arteriosclerosis do well on a strict diet. The diet must not be founded upon the old principle of the low protein diet, but must be founded upon the new principle of the "few protein" diet. The few protein diet implies the absolute exclusion from the dietary of those proteins which are believed to be harmful to the person concerned.

My experience has taught me that no diet in arteriosclerosis is of much use in helping the patient that is not a very strict diet. It is easy to appreciate this fact if you will remember the definition of the disease, and think of the cells as having this acquired food idiosyncrasy against particular proteins so that the cell is made violently ill every time it gets in contact with the smallest particle of the protein which is harmful to it. A small amount of the protein to which a person is idiosyncratic will keep up the irritation of the cells that will cause trouble with the kidneys and irritation of the heart. The progress of the changes in the blood vessels and of the disease as a whole depend upon the irritation of the cells.

The only dietitians that have ever been successful in the world have been found among those who, by many, have been considered "cranks." The crank has a definite belief in some particular thing which he is anxious to promulgate and to apply in the control of mankind. It is only firm believers in dietetics who have held people to a sufficient adherence to special diets to prove or disprove the value of them.

Nothing has done more harm to dietetics that I know of than the over-emphasis of the quantitative values of food products. Of its economic importance there is no doubt, but it always left out of consideration the individual. You cannot determine how little a particular individual can live on except by experiments on that individual. You cannot discover by general experiment how much an excess of food a person can stand until you try it on the person himself. The war in Europe has taught us that the minimum amount of food required for the population is but a fraction of what they were accustomed to consume, and a visit to any fashionable restaurant in New York City will convince you of what an enormous excess of food mankind can absorb and yet pay no immediate penalty.

The quantitative value of food in calories and grammes of protein is fallacious because of the varying abilities of people to take care of and appropriate the food that is given them. The man with nervous prostration needs a large quantity of food because for some reason his nervous system is badly nourished, and it is only by the stimulating support of an excessive diet that he keeps himself going. A person with a tendency to tuberculosis needs an excessive diet because experience has taught us that over-nutrition of the body tends to restoration of immunity and enables that person to combat the tuberculosis of infection. These are particular reasons for the over-ingestion of food.

On the other hand, there may be reasons for temporary starvation. There is no question of the fact that under starvation things are eliminated from certain structures of the body that

are never eliminated so long as there is a large food supply. You starve yourself for a day and you have a headache. You wonder why it is. It is because the current of nourishment has been turned from the tissues to the blood instead of from the blood to the tissues, and you are absorbing into the circulation part of your own tissue; this leads to a certain mild autointoxication and gives you a headache. If you starve long enough the headache will disappear for the balance would be restored again.

Starvation is of value in giving the kidneys rest, in diminishing the volume of circulating blood, and easing up the whole machinery of metabolism in general. Thus, in Bright's disease, with dropsy and a failing heart, one of the now fashionable treatments is to give the person the so-called Karell diet. The Karell diet is no diet at all! It consists simply of a pint of milk a day. On that diet the heart often picks up its strength, the kidneys functionate and a moderate attack of dropsy is cleared up in a few days. Of course, you cannot keep it up.

The quantitative requirements of diet are thus not without interest and value, but vastly more important is a qualitative consideration of diet in the determination of what food materials are harmful to the cells of the particular person who has shown a tendency to degeneration. Here the popular tradition of mankind will help us. We find that everybody, both lay people and the profession, are prejudiced against meat in so-called Bright's disease, which nowadays is called cardiovascular-renal disease and is synonymous with arteriosclerosis.

We find as we study dietetics that there is very little distinction to be made between the flesh of fish, animals and birds. We find that all these flesh proteins clinically react in much the same way. So we exclude from our dietaries the flesh of living things, the flesh of fish, animals and birds.

When we experiment with eggs we find that of all food products they present the most definite examples of food idiosyncrasies we meet.

Eggs have often been overlooked as important in the dietetics of arteriosclerosis. Yet I venture to say that there is not a single example of advanced arteriosclerosis of the usual type, that is, the kind which comes on insidiously without any apparent cause and slowly develops, that is not idiosyncratic to eggs, and I have seen a number of examples of very bad arteriosclerosis which were due to chronic egg poisoning. They present certain definite characteristics, and are quite easy to observe.

The person that is idiosyncratic to eggs always has a coated tongue. He tells you that since he can remember he has never had a clean tongue. Such a person benefits promptly on an egg-free diet.

I have a doctor under observation who came to me for treatment now three years ago at a time when it did not seem as though he would live a month. He had a blood pressure of 230 mm. Hg., swollen feet, severe pain in his chest every time he moved around and numbness in one side of the body which harassed him with the fear of a stroke of apoplexy. He had a badly coated tongue, which he always remembered having. This man was put on a strict regimen because it was an unusually severe condition. He was ordered outdoor exercises, strict diet and several doses of castor oil. On several occasions a phlebotomy of a large amount of blood to relieve his circulation, was necessary. He has been faithful to his treatment and is in pretty good condition. Every time he has eaten eggs in the last three years he has had a very desperate setback, with the return of his symptoms, and he has finally convinced himself that eggs are his arch enemy and were a strong factor in the production of his arteriosclerosis.

Fish idiosyncrasy as a definite cause of arteriosclerosis is not so easy to pick out and prove, but I have seen at least two examples about which I have no doubt. Both of them were captains of coastwise steamships, which made trips back and forth, stopping at particular places where they took on oysters every night. These men formed the habit of gorging themselves with oysters every night and somehow they acquired an idiosyncrasy against them, probably by over-ingestion. They both developed arteriosclerosis and both finally died, because at the time I saw them they had great involvement of the kidneys and had carried their high blood pressure for a long time.

The number of examples of arteriosclerosis developing through meat are probably much greater than through any other single object, and that is in accordance with the accepted traditions that condemns meat more than anything else after the disease has developed.

The important point to remember in this consideration of arteriosclerosis is, that it is ordinarily dependent upon acquired food idiosyncrasies. Therefore, meat is not bad for you, eggs are not bad for you,—if you have money enough to buy them in these days,—but if at any time in your life you have an attack of typhoid fever leading to disturbance of metabolism and permanent change in your relation to your food, then these protein foods may irritate the cells of your body and cause arteriosclerosis. Also if you are subjected at any time to great strain, worry, or anxiety, this is capable of disturbing the metabolism and causing particular proteins to irritate rather than nourish the body. Or, this food idiosyncrasy may be set up from an accidental attack of food poisoning, the so-called "ptomain poisoning." or it may be acquired from the over-ingestion of some particular type of protein.

One of the most interesting examples to me was a man who told me that when he was a boy he gambled for eggs one Easter and won a great many. He consumed all he wanted—and there

were several dozen. He was pretty sick, but he got over it. After that at regular intervals of a few days he was sick again, and no one could account for it. He would go along for a day or two and then have an attack of nausea and vomiting. Finally some one discovered that the attacks followed the eating of any food in which there was a little egg. An egg in any form or quantity would make him sick, and for twenty years he never could eat anything with the smallest bit of egg in it. Being a traveling man it was a source of great trouble. After years he partly recovered from the trouble and was able to eat eggs again without discomfort, but as he acquired arteriosclerosis, it is probable that the sensitiveness to eggs remained in a subsymptomal stage.

In considering the dietetic examples of arteriosclerosis first, I have touched on what I believe the most important causes. However, there are a considerable number of cases that are due to germ infection.

At first sight, it will seem that this would constitute a very different class but it does not, because bacteria do not act as living organisms in their effect on the body, but on account of the particular relations of the proteins of their bodies to the cells of the animal that they have invaded. You get exactly the same immediate action whether you inject live or dead bacteria into the living body. Of course, the live bacteria can go on to multiply and in that way they are much more dangerous, but the immediate effect is much the same whether live or dead bacteria, because they act only through the chemical constitution of their bodies. Now when the body is invaded over a long period by a bacterium against which that body reacts or to which that body is idiosyncratic, then the cells are irritated very much the same way as they are irritated by food proteins and the resulting arteriosclerosis is very much the same. In this way arteriosclerosis develops in some conditions of chronic suppuration, but there are a great many cases of chronic suppurations which do not develop arteriosclerosis because the body is not sensitive.

The person may escape because the bacteria may not get into the circulation or because the cells are not idiosyncratic against them. Thus probably the colon bacillus frequently enters the circulation and does not do any harm. But if the person develops an idiosyncrasy against the colon bacillus, it becomes a source of irritation, may set up abscesses and do a variety of damage. In this way the same rule applies to germs that applies to foods.

We must also consider the form of arteriosclerosis due to specific disease. The syphilitic cases stand out clearly by themselves. In clinical medicine it is very difficult to pick them out, though of course, now we have the Wassermann reaction to help. However, they do not constitute a very large group. Considering the number of people infected by syphilis, the number that go on to chronic involvement of the blood vessels and to arteriosclerosis is not very great. The nervous system is more apt to suffer than the blood vessels in proportion to the number of people infected.

Then there is a group of cases of arteriosclerosis where we cannot be certain as to the origin. They occur in comparatively young people and the infection is not always clear. A good many of these sufferers have had scarlet fever, and some of them a severe infection from gonorrhea. Many of them seem to be primarily disease of the kidneys.

What has delayed our appreciation of the relation of diet to arteriosclerosis has been the existence of these types that depart from the rule, as it were—types that were due to syphilis or infection. In the vast majority of examples, there is no such history. Nearly always you can discover a history of an acute disease, a great period of severe worry, or food poisoning.

If I have succeeded in giving my readers an adequate impression of what this disease is—this arteriosclerosis of our time, the Bright's disease of former times, and the "heart trouble" mentioned on every side—I will not have written in vain.

Arteriosclerosis* is a disease that kills more than twice as many in our generation as formerly. Just why this is so I do not know, but the life insurance people whose business it is to record and study mortality give this out as a definite fact. There is no doubt that it is carrying off a great number of the most useful people, and to check this we need some conception of the nature of the disease. As long as we call it "kidney" or "heart disease," we will never get very far in finding a cause. However, as soon as we recognize it as a disturbance of the chemical functions of the body, we think of a possible change of our food. Cold storage has come in and there is a much larger consumption of food than formerly. People take less exercise. Everybody rides nowadays—if not in their automobiles, in the street cars or some other conveyance. Machinery has taken away the necessity for physical labor. In this way many people are deprived of the best preventive in the world for disturbance of metabolism, namely, exercise. Whether the cause of the increase in arteriosclerosis is a change in our food habits, in our habits of exercise or the so-called strenuous life of modern times, there can be no doubt of the importance of food as an intermediate cause and no doubt of the importance of diet in prevention and cure.

* For a further elaboration of this disease, see Bishop's "Arteriosclerosis," Oxford Med. Pubs., London, 1915.

Original Articles.

A STUDY OF 29 CASES OF ECHINOCOCCUS DISEASE AT THE MASSACHUSETTS GENERAL HOSPITAL.

BY LINCOLN DAVIS, M.D., BOSTON,
Assistant Visiting Surgeon, Massachusetts General Hospital,
AND
GERARDO M. BALBONI, M.D., BOSTON,
Assistant Physician to Out-Patients, Massachusetts General Hospital.

THE literature of hydatid disease in human beings is very extensive. The disease has been studied in all its manifestations and conditions, as to etiology, pathology, diagnosis and treatment. Our excuse for adding to this voluminous literature is to emphasize the fact that with the great influx of immigration from Southern and Eastern Europe, the disease is no longer rare in this community, and the possibility of its occurrence should be borne in mind in all cases of obscure tumors among foreigners.

Etiology and Pathogenesis. In the whole range of medical phenomena there is nothing more erratic or bizarre in its localization or clinical manifestations than the echinococcus cyst. Cases have been reported in nearly every organ of the body; no age is exempt. The disease has been noted in infants, and in early childhood, but is most commonly observed from the 20th to the 40th year. Both sexes are about equally affected.

The echinococcus disease is very widely distributed, almost as much as the dog itself. Its incidence, however, varies greatly in different countries. It is very common in Iceland where the disease is said to contribute to about one-seventh of the death rate. According to Magnuson, the disease is on the decrease now, due to broader education of the public in regard to prophylaxis. Next to Iceland in frequency of infection are the sheep and cattle raising countries. It has been a scourge in Australia, New Zealand, the Argentine Republic and Uruguay. The spread of the disease in these countries is undoubtedly due to the prevalence of echinococcus infection in sheep, cattle and swine, and the careless way in which at many abattoirs the offal from these is given to dogs, thus completing the parasitic cycle.

The continent of Europe has not been exempt. In Germany the provinces of Pomerania and Mecklenburg are most severely infested. In the steppes of Russia the disease is also common. In Southern Europe, certain provinces of Italy, i. e., in the Maremma, the Neapolitan provinces and Sicily; certain parts of France, and in Greece, the disease is common, as may be readily seen from the frequent case reports in the French and Italian literature. We have no available statistics of the disease among the Armenians and Syrians, but undoubtedly the disease is prevalent, as the social condition of the people is very primitive, and their relations to the domestic animals, particularly the dog, are more intimate than among those of a higher civilization.

A considerable number of cases have been reported in the United States and Canada, especially in Manitoba where there are many Icelanders. Most of the reported cases are among foreigners who brought their infection with them to this country. Very few indigenous cases have been reported. Echinococcus infection of the dog seems to be very rare in this country. Because of the ever-increasing immigration of the lower classes from Southern Europe, Turkey and Armenia to America, however, and with the permanent opening of the Panama Canal, the disease will probably be more often met with than in the past.

The disease is caused by a minute tapeworm, the tenia echinococcus. This tapeworm exists in the intestine of the dog, cat, jackal, wolf, and perhaps in other carnivorous animals. The infected animal excretes in the feces myriads of microscopic eggs of this worm, which are distributed over the grass and vegetation of fields and hillsides, and into the water of streams, lakes, ponds, and unprotected wells and reservoirs. Once the waters are infected with hydatid ova the disease may be distributed to a number of animals, and perhaps water fowl may play a not unimportant rôle in its spread. According to Gordon McDonald of New Zealand, dust storms act as carriers. The eggs are light and are easily blown about in the dried mud of towns, which is contantly being pulverized.

Human beings, by drinking contaminated water, or by eating uncooked vegetables and roots, particularly water-cress, dandelions and lettuce, may become infected. Infection may also take place by direct contact with infected dogs, as in handling or petting them. Whereever there is close association between man and dog, personal uncleanliness, and carelessness in handling food, there is most likelihood of infection. Domesticated and grazing animals, particularly sheep, cattle and swine, are commonly subject to hydatid disease in infected districts. Wild animals may also be infected; the disease having been reported in twenty-seven species of mammals. The dog, which harbors the parent parasite, the tenia echinococcus, is not itself subject to the hydatid form of the disease, which is the larval stage in the life cycle of the parasite, and occurs only in the intermediate hosts such as the domestic animals and man, the result of ingestion of the eggs. If the dog is fed upon flesh or viscera containing hydatid cysts, it develops in turn an adult tapeworm, and the cycle is completed. When the eggs of the tenia echinococcus are swallowed by the intermediate host, the gastric or intestinal secretion attacks their outer shells, and the embryos are set free.

By means of their six hooklets they burrow into the walls of the stomach or intestines, frequently penetrating the ramifications of the portal vein, and by it are carried to the liver where they may be arrested in its capillary circulation.

It is in the liver that the great majority of hydatid cysts occur. The embryos may penetrate directly into the systemic circulation and reach the heart, and from there be carried to the lungs. If they succeed in passing through the capillaries of the lungs, reaching the general circulation, they may go wherever the blood stream takes them, to form hydatid cysts in the kidney, brain, or muscles. It is possible that the embryo may reach the circulation through the lymphatic system; it may also directly penetrate into the peritoneal cavity. It is thought also, that under certain conditions it may enter through the respiratory tract and develop in the lungs. Hutchins of Australia reports a case of a farmer who was bitten in the buttock by a cattle dog, and twenty years later developed an echinococcus cyst in that region. Prat of Uruguay reports a case of echinococcus cyst of the tongue. This appears to be the only case of the kind in the literature. These cases would seem to show that the part generally understood to be played by the digestive juice in liberating the ovum from its glutinous sheath, is not absolutely necessary for its development.

The embryo having once reached its destination, undergoes certain changes. The hooklets disappear, and the embryo is gradually converted into a small cyst, with two distinct layers containing a clear fluid. The cyst is enveloped in a fibrous covering, the result of reaction on the part of the neighboring tissues. Buds develop from the parenchymatous layer of the parent cyst, from which daughter cysts develop. As the parent cyst grows, it may become packed with innumerable daughter cysts, which in turn may give rise to granddaughter cysts. From the lining membranes of the cysts, little bodies, armed with hooklets and known as scolices, are developed, which represent the heads of future teniae. If these scolices gain access to the intestinal tract of the dog, they develop into adult worms.

The disease exists in two forms, the most common being the echinococcus unilocularis, and the rarer form, echinococcus multiocularis vel alveolaris. According to Watson, the echinococcus multilocularis has never existed in Australia, either in man or beast. Magnuson, in a report of 214 cases in Iceland, noted no case of the alveolar type. Neither did Cranwell and Vegas of the Argentine Republic, in a large series of cases, note a single case, nor Prat of Uruguay in a series of 149 cases. In Lyon's study of the disease in North America, out of 241 cases only four were of this type. In none of our cases at the Massachusetts General Hospital was the multilocular type noted.

The distribution of the echinococcus alveolaris is peculiar, being almost exclusively restricted to two principal regions, one comprising Southern Germany, Switzerland and the Austrian Alpine region, the other, Southeastern Russia and Siberia. Posselt attempts to explain this distribution by reference to the fact that this form affects almost exclusively cattle, and very rarely sheep. In the districts in question, cattle raising, rather than sheep raising, is the principal industry. Ostertag, quoted by Frielberger and Fröhliner, considers it probable that the multilocular echinococcus does not represent a mere variety of the ordinary echinococcus, but a particular species with an, as yet, unknown tapeworm.

Hydatid cysts are of slow development, and may reach enormous size. Magnuson has reported one case under observation for forty years. They have been reported as weighing over 30 lbs. Death of the embryos may occur, with degeneration and calcification of the cyst. A fatal outcome may result from pressure of the cyst upon vital organs, or by encroaching upon and destroying the tissue of essential glands, the secretions of which are necessary to life. A serious consequence is infection, which may take place spontaneously, resulting in abscess formation, and occasionally pyemia. The cyst may rupture into any neighboring hollow organ, resulting in discharge of the smaller cysts into the stomach, intestine, bladder, or respiratory passages. They may rupture into the peritoneal cavity with dissemination of the growths. The cystic fluid contains a virulent toxic agent, which, when liberated into the tissues or peritoneal cavity, causes inflammatory reaction and marked constitutional disturbances, occasionally sudden anaphylactic shock and urticaria. The fatal result in Case 8 of our series may have been due to anaphylactic shock.

The bile passages and large venous trunks may be invaded, with serious results. Occasionally the cysts rupture externally and are discharged on the surface of the body.

Symptoms. The symptoms of echinococcus disease are those of a slowly growing tumor, varying with the location of the growth, and are well exemplified by the appended case histories.

Diagnosis. A slowly growing tumor, particularly one involving the liver, without cachexia, in a young adult who has lived in an infected district, is characteristic of the disease. Occasionally the so-called hydatid thrill, which is unmistakable and pathognomonic, may be elicited. It was obtained in two of our cases. The discharge of daughter cysts or microscopic heads or hooklets from the body cavities is, of course, positive evidence.

Laboratory Tests. Memmi in 1901, studying the blood of six patients suffering from hydatid of the liver, noted an eosinophilia varying from 6 to 18%; others confirmed Memmi's findings, and it was thought that an increase of eosinophiles was pathognomonic of the disease. In

some cases of the disease eosinophiles had been found as high as 68%. It is claimed that an eosinophilia is more frequent in patients where the tenia echinococcus is alive, and is absent where it is dead; also that it varies in the same individual without any apparent cause. That the eosinophiles increase after an exploratory puncture, operative interference or spontaneous rupture of the cyst.

Krenter and Zapelloni independently made an exhaustive study on the subject of the value of the various tests for echinococcus disease, eosinophilia, the precipitin test of Fleig-Lisbonne, and the complement-fixation test of Bordet-Gengou based on the Wassermann reaction, as first applied by A. Ghedini. They conclude that eosinophilia is present in about 60% of echinococcus cases, and when present is suggestive, but not confirmatory, of the disease. Eosinophilia is present in many other conditions. In our own series of cases, eosinophilia was present in only one case (No. 26) in which there was 7% of eosinophiles. The precipitin test of Fleig-Lisbonne is generally conceded to be inconstant, and of no great diagnostic value.

The complement-fixation test of Bordet-Gengou, based on the Wassermann reaction, is the most reliable test we have. This test was first applied by A. Ghedini in Maragliano's clinic at the University of Genoa in 1906. Ghedini used as an antigen the cyst fluid obtained from an echinococcus cyst of the liver in a boy of thirteen. In 1909 he reported that the test had been found positive in 40 out of 42 cases of proved echinococcus disease. His findings have been confirmed by other investigators, especially Krenter and Zapelloni who reported the test positive in 93% of their cases.

In the last three years the echinococcus complemental test has been used at the Massachusetts General Hospital by Dr. J. Homer Wright. Ninety-seven tests in all have been made. Twelve were positive and eighty-five were negative.

Of the twelve positive cases, seven proved to be echinococcus disease. One of the five other cases at operation showed an abscess in the abdominal wall, which upon microscopic examination showed no evidence of tuberculosis. Its appearance was not inconsistent with echinococcus cyst. One had clinically a large spleen and liver, a positive Wassermann reaction, and was not operated upon. Three were clinically syphilis and had weak to strongly positive Wassermann reactions.

Among the eighty-five negative cases, twenty-four had a positive Wassermann reaction. The Wassermann reaction was negative in five of the proved echinococcus infections. It was not done in the remaining two.

There was some variation in the strength of the echinococcus reaction in the same patient from time to time. The cyst fluid proved a better antigen than the alcoholic extract of the cyst wall. The cyst fluid was found active as an antigen after more than eighteen months outside of the body.

Treatment. The treatment of the disease is purely surgical. The use of salvarsan has been proposed by Kolbe, who reported two cases in which it seemed to have had some effect in destroying the embryos. Reference to the literature shows that it has been tested extensively by others, notably Deve, Payenneville and Weinberg, with absolutely negative results. It occurred to us independently to make use of it in one case in which the complement-fixation test remained positive after operation; there was no apparent effect on the reaction. Tapping of cysts through the abdominal wall is to be condemned on account of the danger of leakage of fluid and daughter cysts into the peritoneal cavity, with dissemination of the disease. The tumor should be exposed by surgical incision, and a thorough exploration of the peritoneal cavity in abdominal cases for subsidiary cysts should precede the attack on the main cyst. After exposure and adequate walling-off, the cyst should be tapped and the fluid carefully withdrawn. The fibrous capsule should then be incised cautiously, whereby the inner cyst wall may often be separated from its outer sheath and drawn out entire. This is the ideal procedure. When this is not possible, on account of infection, adhesions, calcification, etc., as much of the inner cyst as may be is removed, and the cavity packed with gauze and allowed to granulate. Marsupialization is not often necessary with modern methods of walling-off, but is desirable in cases in which all the daughter cysts have not been removed at the primary operation. Of course it is most desirable to remove all of these whenever possible. In suppurative cases free drainage must be established. The results of the modern operation, in the absence of suppuration in the cyst itself, are extremely good.

ABSTRACTS OF CASE HISTORIES.

CASE 1. *Echinococcus cyst of liver.*

M. R. 321-244. J. P. Male. Age 34. Born in England. Weaver. Admitted August 6, 1875. Well up to 5 months ago, when he began to have pains in his stomach after meals. The pain was located on the right side, over the ribs and at this spot a tumor soon made its appearance. Jaundice and marked loss of flesh. On examination there was tenderness in the epigastrium and right hypochondrium, with an area of dullness extending from the costal margin to within two inches of the umbilicus.

Ten days after entrance it was noticed that there was a sudden decrease in the size of the tumor. A few days later, he passed with the dejection a number of cystic bodies which were preserved for examination. On August 30 the tumor was aspirated and about 40 ounces of yellowish-brown fluid withdrawn, having a powerful fetor; the fluid containing bile, pus and albumin. Considerable pain and fever followed the aspiration. The swelling nearly wholly

disappeared, leaving slight tenderness. Discharged relieved on September 9th.

CASE 2. *Ecchinococcus cyst of liver.*
E. S. 266-16. C. H. Sailor. Age 32.
Operator, Dr. M. H. Richardson.

Admitted to hospital August 3, 1891. Always had a dog on board ship. One month ago was taken with abdominal pain and nausea. A few days ago noticed a lump in the right side of the abdomen. Chills and fever.

A strong, robust man, with a large tumor in the right side of abdomen, extending from the costal margin to the crest of the ilium. The mass gave a sensation of fluctuation but no thrill.

Operation. Incision made in the flank over the tumor. Wall of the mass sutured to the parietal wound. An incision was then made through about one-quarter inch of normal liver substance into the cyst. A very large number of cysts and quantity of pus evacuated. Cavity packed with gauze. Patient discharged in excellent condition.

Case reported by Dr. M. H. Richardson. BOSTON MEDICAL AND SURGICAL JOURNAL, April 28, 1892.

CASE 3. *Echinococcus cyst of liver.*
E. S. 342-90. Armenian. Gardener. 28 years old; in the United States 7 years. September 6, 1898.

Operated on by Dr. W. M. Conant, September 13, 1898.

Previous history of malaria. Three years ago abdomen injured by a falling iron pipe. No subsequent symptoms except a slight swelling which soon passed off.

Present Illness. Thirteen months ago first noticed the presence of a tumor in the right hypochondium. This was at first the size of an egg, then gradually increased. Has lost 30 lbs. in weight in 6 months.

Well developed and nourished man. In the right hypochondrium, extending from the costal margin above, to the level of the umbilicus below, there is a rounded swelling, flat to percussion, tense, non-fluctuant; no tenderness; smooth in contour. Heart pushed up; apex beat at 4th interspace.

White cells, 10,500.

Patient's evening temperature of 101 to 101.5.

Operation. Cystic tumor connected with under-surface of the liver was exposed, tapped, and clear fluid withdrawn. The cyst wall was then incised. Large cavity cleaned out with gauze. Portion of sac excised, edge of sac sutured to abdominal wall. Wound packed with gauze. Patient made a good recovery. Discharged relieved October 30, with a small sinus.

Pathological report by Dr. W. F. Whitney: cysts containing scolices characteristic of tenia echinococcus.

CASE 4. *Echinococcus cyst of liver.*
S. S. XXIX-68. R. G. Irishwoman. 31 years old. Single.

Operated on by Dr. C. B. Porter.

Admitted to hospital November 15, 1898. Five years ago had tumor removed from liver. Well for 3 years; then pains returned in region of hypochondrium. Examination negative except for large liver.

Operation. Cyst of liver tapped, peritoneum sutured to fibrous cyst wall; cyst then opened and inner sac removed.

Cavity packed with gauze. Convalescence slow. Considerable drainage.

Discharged relieved December 28, 1898.

Pathological report, echinococcus cyst.

CASE 5. *Ruptured echinococcus cyst of liver.*
S. S. XXX-66. L. P. Russian. 19 years old.
Operated on by Dr. C. A. Porter.

Brought to Accident Room July 13, 1899, with a history of having been struck in the stomach and knocked down. Patient was shrieking with pain, vomiting large quantities of watermelon at intervals.

Examination. Marked emaciation. Abdomen very prominent, especially in upper half, which was distended and rigid. Evidence of free fluid in the abdomen. No definite tumor.

White count, 34,000.

Operation. Incision through the right rectus. Large amount (estimated at 3 quarts) of bloody fluid escaped. A ruptured cyst was found the size of a football, lying free in the peritoneal cavity; exploring the liver there was found an opening on the upper surface of the middle of the right lobe, which led into a large cavity. This cavity was packed with gauze and a portion of the sac was sutured to the abdominal wall. Considerable post-operative shock. Slow convalescence.

September 9th, discharged with a discharging sinus.

October 21, 1899, re-admitted for discharging sinus. The sinus was opened up again, curetted and cauterized.

Uneventful convalescence.

CASE 6. *Echinococcus cysts of omentum and liver.*
E. S., 670-259 and 672-11. S. K. Greek. 27 years old.

Operated on by Dr. F. B. Harrington.

Admitted to the hospital December 23, 1899. In this country 7 years. For a month has felt pain in the region of the liver and noticed a tumor which has been steadily enlarging. Unable to work for two weeks.

Examination showed considerable bulging of the lower ribs on the right side. The mass is dull on percussion, extends from 4th costal space to the level of the umbilicus on right.

Operation. January 6, 1900. Incision through right upper rectus; a cyst the size of a hen's egg removed from the omentum. Liver found much enlarged. Intestinal clamp placed on the portal vein and hepatic artery; incision made through anterior surface of the liver. A large cyst with thick, white wall opened, with escape of a large quantity of fluid. Sac of cyst removed intact. Another cyst, the size of a baseball, found at the upper portion of the liver; the sac of this was likewise removed. A fourth cyst, the size of a baseball, was found in the left lobe of the liver, which was not removed. Edges of liver wound sutured; clamps removed from portal vein and hepatic artery. Three rubber tubes placed in cavity of liver. Patient had some post-operative bronchitis; drained considerable bile and blood from the wound. On the 7th day of convalescence, patient suddenly became markedly cyanotic and died very suddenly.

Autopsy No. 2518. Echinococcus cysts of liver, broncho-pneumonia, fibrino-purulent pleuritis, chronic perisplenitis. Hyperplasia of spleen, congestion of kidneys. Pathological report of specimen removed at operation,—echinococcus cyst.

CASE 7. *Echinococcus cysts of liver and lungs.*

S. S. No. 130122. K. S. Armenian. Laborer. 40 years old. In this country 6 years.

Operated on by Dr. C. B. Porter.

Admitted to hospital December 13, 1902.

For the last 10 weeks there has been progressive loss of strength and weight, accompanied by pain in the epigastric region. Two weeks ago stopped work. History of fever but no chills.

A well-developed man, much emaciated and pale. Very slight jaundice.

No leucocytosis.

One-tenth of albumin in the urine.

The lower portion of the right chest bulging. There was flatness from the 4th rib in front to 4 fingers' breadth below the costal margin. Below the ribs there was a bulging tumor extending nearly to the median line.

Operation. Incision over the tumor which consisted of an enlarged liver. Aspirating needle found pus on the second attempt. An incision was then made through the liver substance, and pus, gelatinous material and cysts, estimated at 4 quarts in amount, evacuated. There was considerable hemorrhage. Wound packed with gauze. Died on the 4th day after operation.

Autopsy No. 981 showed an evacuated echinococcus cyst of liver; small abscesses of liver, and echinococcus cysts of lungs.

Case reported by Dr. A. K. Stone in the BOSTON MEDICAL AND SURGICAL JOURNAL, September 3, 1903.

CASE 8. *Echinococcus cysts of peritoneal cavity and liver.*

W. S. 459-277. Irishman. Aged 52. Single.

Admitted to hospital January 29, 1904.

Operated by Dr. M. H. Richardson.

Previous history. Six years ago while in Havana was seized with a severe pain in the right side, associated with cough. Was operated on later in New York.

Present Illness. Fairly well up to one and one-half years ago, when he began to vomit. Noticed a lump in the abdomen which has grown larger lately. Has felt weaker.

Well developed and poorly nourished man. Liver dullness extends from the seventh rib to level of the umbilicus. Abdomen generally dull to percussion. Below the liver to the right of the umbilicus, a hard, firm mass visible through the abdominal wall, about the size of an orange, non-fluctuant. Another one occupying the bladder region. In the left iliac region there is another indefinite mass. By rectum a large mass can be felt in the pelvis.

Hemoglobin 50 per cent.; white cells 5300; red cells 3,888,000.

Operation. Median laparotomy. Numerous cysts found, varying in size from a walnut to that of an orange; most of them were attached to the mesentery. Five of these were punctured and the lining membranes removed; two were removed entire. Patient's condition suddenly failed during operation and he died.

Microscopic examination of specimens by Dr. W. F. Whitney showed them to be echinococcus cysts.

CASE 9. *Echinococcus cyst of liver.*

W. S. 499-191. Italian woman. 24 years old. single.

Admitted to hospital April 14, 1905.

Operated on by Dr. S. J. Mixter.

History of pain in the right half of abdomen for one month; intermittent in character. No vomiting. Never jaundiced.

Examination. Negative, except for a bulging mass below the costal margin on the right; firm, tender, moves with respiration.

Operation. Tumor of the right lobe of the liver with intestinal adhesions. Tumor enucleated from the liver. Bleeding controlled by packing. Much post-operative pain; considerable drainage. Steady convalescence.

Discharged, relieved, May 16, 1905.

May 25, 1905; in good health.

Began working four months after operation.

Pathological report of specimen, echinococcus cyst.

CASE 10. *Echinococcus cyst of liver.*

S. S. CXXXIV-77 and CXLIII-47. Swede. Age 49. Single.

Admitted to hospital August 24, 1906.

Operated on twice by Dr. D. F. Jones.

Five months ago jaundice, with clay-colored stools. About the same time a small lump was noticed in the epigastrium. The lump has been enlarging lately. Never painful.

Examination. The tumor extends from the costal margin on the right to below the level of the umbilicus; dull on percussion; slight tenderness on pressure; suggests cysts on palpation.

Operation. Large cysts of the liver opened and drained. Condition of the patient did not permit of the removal of the lining membrane. Uneventful recovery.

Pathological report. Echinococcus cysts.

June 29, 1907, re-entered hospital with a history that up to one month ago he had been well. Then began to have sharp pain in right side; jaundiced. Vomited for the last three days.

Examination. Marked jaundice. Definite tumor on the right side, extending about three inches below costal margin.

July 6, 1907. Operation, incision and drainage of echinococcus cyst of liver. Uneventful convalescence.

Reported August 1, 1908. Excellent condition.

CASE 11. *Echinococcus cysts of pleural cavity and peritoneum.*

E. M. 661-97 and E. S. 558-175 and 572-91. Russian farmer. 22 years old.

Operated on by Dr. F. B. Harrington.

Admitted to hospital December 12, 1906.

In the United States three and a half weeks. Was taken ill on steamer; ill ever since. Sole complaint is pain in the right side. One day feels pretty well, next day sick all over.

Signs of fluid in the right chest.

On December 13th chest tapped twice in the posterior axillary line and about one pint of thin greenish fluid obtained. Abdomen flat, held rigid, tympanitic throughout, no masses. Liver border two inches below costal margin. Hemoglobin 75%, white cells 18,000.

Operation. Resection of rib; pleural cavity opened, with the escape of cysts of all sizes. Cysts repeatedly discharged from wound during convalescence. Masses developed in the abdomen, one in the iliac fossa, another in the region of the bladder.

Operation January 19, 1907.

Pelvic cavity found full of cysts which were adherent to the rectum, bladder and intestines. Cysts

freed and removed. Small incision made in the intestine and a mass of ascaris lumbricoides removed. Intestinal wound sutured. Pelvis flushed out with corrosive sublimate 1-1000 followed by salt solution. Abdominal wound closed without drainage. Good recovery. Purulent discharge with occasional cysts continues from the chest wound.

Operation (February 8.)

Section three inches long of 5th, 6th and 7th ribs removed. Cavity curetted. No further cysts found. Discharged to Convalescent Home on March 6th. Subsequent history unknown.

CASE 12. *Echinococcus cysts of common bile duct and lesser peritoneal cavity.*

W. S. 559-83. Italian laborer. 28 years old.

Operated on twice by Dr. S. J. Mixter.

Admitted to hospital March 22, 1907. During the last two years and also eight months ago had attacks similar to present illness; pain in right upper quadrant.

Jaundiced for 8 days, tenderness and rigidity in region of gall bladder.

Liver dullness extends from 6th space to 2 inches below costal margin; edge of liver distinctly felt.

Operation. Cholecystectomy, for cholecystitis. During convalescence had an attack of pain in the region of wound, with some elevation of pulse and temperature. Discharged to Convalescent Home.

Re-admitted from Convalescent Home, April 28, 1907, with temperature, pain and chills. Marked tenderness over whole right side of abdomen.

Second operation, April 30. In the region of the common duct a cyst was found lying chiefly in the lesser peritoneal cavity. Cyst tapped, pus and bile drawn off. It was then freely incised, with the escape of about 8 oz. of thick bile-stained fluid containing many small ruptured and unruptured cysts. Cavity irrigated, drainage tubes inserted. Uneventful convalescence.

Pathological report of specimen, echinococcus cyst. Patient later went back to Italy and reported to be in good health.

CASE 13. *Echinococcus cyst of gastro-hepatic omentum.*

E. S. 580-269 and E. M. 671-271. Greek laborer. 23 years old.

Operated on by Dr. Hugh Williams.

Admitted to hospital July 15, 1907.

For eleven months has had considerable soreness in epigastrium. No vomiting or jaundice; has lost 17 pounds in weight.

Examination. Abdomen generally tympanitic, save over right hypochondrium where there is slight dullness just below right costal margin. Heart and lungs, negative. Spleen and liver not palpable. Reflexes normal.

Hemoglobin 90 per cent.; white cells 4,200. Stools negative.

Typical hydatid thrill was elicited over the gall-bladder region.

Operation. Gall-bladder incision. Mass felt posterior to gastro-hepatic omentum, under the left lobe of the liver. Walling off gauzes placed; mass incised; a large hydatid cyst opened; large number of small cysts evacuated. One rubber tube and two gauze wicks placed in the large cavity. Slow convalescence. A subdiaphragmatic abscess was opened at the end of two weeks. Gradually improved. Jaundice which had been present cleared up. Patient was discharged on September 7th, with small sinus, to the Convalescent Home. Subsequent history unknown.

CASE 14. *Echinococcus cyst of liver.*

S. S. CXLVIII-253. Greek peddler. 35 years old.

Operated on by Dr. D. F. Jones.

Brought to Accident Room July 19, 1907, with history of attacks of pain in the epigastrium, of indefinite character, for the last 6 months. Noticed no jaundice. For the last 10 days pain has been more severe in right upper quadrant.

Examination. Abdomen rigid; some tenderness on pressure. Edge of liver two fingers' breadth below costal margin.

Operation. Median laparotomy. Large cyst of the left lobe of the liver disclosed; walling-off gauzes carefully placed; cyst incised, with the escape of 1 pint of fluid and many daughter cysts. Cyst cavity lightly curetted, wiped with gauze and packed. Considerable post-operative shock and restlessness. Second day patient began to vomit; pulse poor; increasing abdominal distention. Gradually failed and died on the third day.

Pathological report, echinococcus cyst.

CASE 15. *Echinococcus cyst of liver.*

E. S. 606-1. Icelander. Age 33. Traveled in this country 17 years.

Operated on by Dr. C. L. Scudder 3 times, 4th time by Dr. Hugh Williams.

Admitted to hospital March 17, 1908. For three years attacks of pain in right hypochondrium, with chills, nausea and vomiting. Attacks come suddenly, recurring every 3 to 5 weeks. Has had some pain in the lower abdomen. For the last 4 weeks attacks of pain have been worse, with chills, fever and sweating.

Examination. Small, poorly developed and nourished woman. Tenderness, rigidity and spasm in right hypochondrium; slight tenderness in right lower quadrant. Liver felt two inches below costal margin.

Operation. (March 25, 1908.) Exploratory laparotomy. Adhesions about the gall-bladder. Gall-bladder itself not involved. Large cyst of the liver found above the gall-bladder. Cyst opened and cavity curetted; edge of sac sutured to the peritoneum. Cyst cavity swabbed out with Harrington's solution and packed with gauze.

Pathological report by Dr. W. F. Whitney: echinococcus cyst. Patient ran a septic temperature.

Secondary operation April 8th. Previous incision opened, another cyst removed from the lower surface of the liver, and an abscess of the liver substance incised and drained. Patient ran an irregular temperature, with occasional chills.

X-ray of chest negative.

May 11th, third operation. Incision re-opened, no more cysts found. Old abscess re-opened and a few ounces of thin grumous pus removed; drained with tube and gauze. After a few days chills recurred, with temperature. Considerable discharge from wound.

June 20th fourth operation. Liver explored. A number of soft spots on the surface of the liver found, which, on puncturing, emitted small amounts of pus. Drainage.

Patient put on vaccine treatment with some improvement. July 30th, discharged unrelieved.

CASE 16. *Echinococcus cyst of liver.*

W. S. 565-265. Italian laborer. 20 years old. Two years in this country.

Operated on by Dr. F. G. Balch.

Admitted to hospital June 15, 1908. For about one month has noticed a swelling in the right hypochondrium which is painful and prevents working. Swelling came on suddenly. Never jaundiced.

Examination. Abdomen presents a smooth, rounded swelling in the right upper quadrant, causing a bulging of the lower ribs. Tumor is tense, not tender; descends with respiration. Liver dullness extends to within one inch of umbilicus.

Operation. Echinococcus cyst on the anterior portion of the liver disclosed, tapped, incised and marsupialized. Clear fluid escaped with one daughter cyst. Convalescence uneventful.

Patient had more or less pain following the operation, for 7 months; vomited frequently, unable to work. Re-entered hospital and remained 10 days; the symptoms quieted down without further operation.

Six years later patient reported in excellent health.

CASE 17. *Echinococcus cyst of liver.*

W. S. 631-287. Greek laborer. 32 years old.

Operated on by Dr. F. G. Balch.

Admitted to hospital May 26, 1909.

One year ago attack of severe abdominal pain; had to give up work. A week later another attack of pain. Since then has had numerous attacks lasting about one hour; relieved by heat. No connection with meals. Vomited twice, jaundiced for two months. Last attack of pain, two days ago, required morphia.

Examination. Prominence in epigastrium over left costal edge, where there is an excoriation of the skin. Spleen palpable. Liver dullness extends from fourth rib to two inches below costal margin. Tender area in middle of epigastrium. No shifting dullness.

Blood. Hemoglobin 80 per cent.; white count 11,800; differential count not remarkable.

Operation. Cholecystostomy with removal of small cyst from gall-bladder, no stones. Liver seemed enlarged, with white spots on it. Convalescence uneventful.

Examination of cyst suggested echinococcus disease.

Re-admitted into the hospital with history of chill three days ago, pain in chest, profuse sweating and fever.

White count 18,300.

Abdomen soft to pressure, tympanitic. Liver edge not felt.

Operation. Exploratory laparotomy; nothing found. Patient failed rapidly and died.

Autopsy No. 2399 showed echinococcus infection of liver; abscess of liver; fibrino-purulent peritonitis.

CASE 18. *Retroperitoneal echinococcus cyst.*

W. S. 649-91. German woman. Age 48. Married.

Operated on by Dr. Hugh Cabot.

Admitted to hospital November 26, 1909. No previous illness except stomach trouble. Noticed lumps in both breasts, May, 1909, about size of hen's eggs. No pain or tenderness.

In the abdomen there is an indefinite tumor extending from the costal margin to one and one-half inches below umbilicus on the right side; smooth contour; no tenderness.

Cystoscopy and catheterization of ureters negative.

White count, 11,400.

Operation. December 13; laparotomy. Large retroperitoneal tumor exposed. This was opened with the escape of a great number of small cysts, and a large amount of thick, yellowish, custard-like material. Sac well dissected out from the surrounding tissues and removed entire; wound closed without drainage. At the same sitting the left breast was amputated for cystic disease.

Pathological report; echinococcus cyst.

Patient made an uneventful recovery.

Reported at the hospital January 10, 1911. Feels well. Gained 30 pounds.

CASE 19. *Echinococcus cyst of left kidney.*

No. 194553. Italian laborer. Age 23. Single.

Operated on by Dr. Hugh Cabot.

Admitted to hospital March 23, 1914.

As a boy in Italy had a dog that he played with and often slept with.

Two years ago passed a small colorless, bean-like body in his urine; no pain or blood. Five months later he passed several more similar masses, and since then, has passed many such bodies. Lately has had more or less pain in lower half of abdomen but has kept on with his work. A cyst passed 3 weeks ago was submitted to microscopic examination and showed a thin laminated membrane containing clear fluid.

Examination. Spleen non-palpable. Liver not enlarged. No extraneous masses. Collargol injection of kidney pelvis normal.

Renal Function. Appearance time 13 minutes; 38 per cent. in 1 hour.

Echinococcus fixation test positive.

Operation, nephrectomy. Specimen consisted of an enlarged kidney and at one end a cyst the size of a small tangerine orange. On section, the kidney substance was almost entirely replaced with numerous small thin-walled cysts containing scolices of the echinococcus. Many of these cysts lay free in the kidney pelvis and upper part of the ureter. Convalescence uneventful.

April 22, complement fixation test negative.

Patient well and working.

CASE 20. *Echinococcus cyst of kidney.*

E. S. No. 196614. H. P. Female. Age 35. Greek.

Operated on by Dr. F. Cobb.

In the United States 7 years. Admitted to hospital July 24, 1914.

Fifteen years ago had an attack of pain in the upper left quadrant and noticed a small tumor at the same time, which has been slowly increasing in size. During the last two months pain in the left side has increased in intensity. Pain radiates to the pubic region and to the thigh. Vomiting the last two weeks. No jaundice. General weakness.

Examination. There is a large mass in the abdomen filling the whole left side. It extends from under the costal margin on the left to a point midway between the pubes and umbilicus. No edge or notch felt.

Blood examination. Hemoglobin 90 per cent.; reds 4,900,000; whites 13,000. Mononuclears 78 per cent.; basophiles 20 per cent.; eosinophiles 2 per cent.

Renal function normal.
X-ray negative.
Wassermann test negative.
Operation. Exploration showed tumor to be retroperitoneal and connected with the kidney. Incision closed. Incision made in flank. Large cyst attached to kidney ruptured with escape of large amount of fluid and many cysts. Nephrectomy. Uneventful convalescence.
Pathological Report. Echinococcus cyst of the kidney.
Echinococcus Fixation Test. Positive.

CASE 21. *Echinococcus cysts of liver and right kidney.*
E. S. No. 197628. Italian laborer. 34 years old. Married. Fourteen months in the United States.
Operated on by Dr. Lincoln Davis.
Admitted to the hospital September 12, 1914.
About a month ago was taken with sudden severe abdominal pain which compelled him to quit work. Pain localized in the upper quadrant. Since the first attack has never been free from pain, but not sick enough to be in bed; some fever, digestion disturbed. Severe attack of pain in the upper right section of the abdomen on the day of entrance, with a temperature of 102. Bile in urine.
Pre-operative diagnosis. Acute cholecystitis or high appendix.
Operation. Gall-bladder, duodenum and stomach not remarkable. Inflammatory mass felt in region of the right kidney. Abdominal incision closed.
Lumbar incision made, kidney a mere shell containing a large quantity of thin fluid and many cysts of all sizes. Incision enlarged, cavity explored with hand and found to lead up to the liver. Cavity irrigated, drained with gauze and tubes. Uneventful convalescence.
Wassermann test negative.
Echinococcus complement fixation test positive.
October 13, salvarsan 0.3 given.
Complement fixation test remains positive after salvarsan.
Present condition, good; working.

CASE 22. *Retroperitoneal echinococcus cyst.*
E. S. No. 200539. Italian laborer, D. C. Male. Age 44.
Operated on by Dr. Lincoln Davis.
Admitted to hospital February 27, 1915.
For four months has noticed a lump in the right lower quadrant. No pain. Some backache.
Examination. In the right lower quadrant of the abdomen is a large, hard mass filling the whole quadrant. Typical hydatid thrill elicited by heavy percussion over the tumor.
X-ray, negative.
First complement fixation test negative.
White count 10,800.
Operation. Incision through the border of the rectus. Large retroperitoneal tumor extending from under the ribs down to the pelvis and to the median line. An attempt was made to shell out the tumor; found to be impossible. Walling-off gauze placed and cyst opened. Large number of daughter cysts evacuated. Cavity extended under ribs in the region of the right kidney. Kidney could not be made out. A large portion of the anterior wall of the cyst was excised, its edges sutured to the peritoneum, and the cavity packed with gauze.
Convalescence uneventful except for considerable post-operative temperature. Wound gradually closed.
Pathological report of specimen, echinococcus cyst.
Complement fixation test April 2, strongly positive.
Present condition good; patient working.

CASE 23. *Echinococcus cyst of liver.*
E. M. No. 204860.
J. E., Syrian laborer, age 34.
Operated on by Dr. D. F. Jones.
Admitted to hospital October 20, 1915.
One year ago had an attack of severe intermittent epigastric pain radiating to lumbar region. Attacks lasted for about an hour, and came every few hours for about two weeks. Feels nauseated, but does not vomit. Pain has no relation to eating. Two days ago had an attack lasting one hour. Has never noticed any jaundice up to now.
Examination shows liver dullness extending from 5th rib to 5 cm. below costal margin; edge felt. Spleen palpable. Moderate jaundice.
Echinococcus fixation test weakly positive.
Blood: 6,320,000 reds, 6700 whites. Differential count not significant. Coagulation time of blood, 5 minutes.
X-ray shows no evidence of gallstones, but a process involving the pylorus suggestive of malignant disease or specific.
October 25, 1915, operated on before the Clinical Congress of Surgeons.
Preoperative diagnosis, echinococcus cyst.
On the under surface of the liver there was a tumor, giving the characteristic thrill. Incision enlarged by a lateral cross-cut; walling-off gauze placed and cyst punctured, with the escape of a few daughter cysts. Cyst wall removed with forceps, leaving a cavity about the size of an apple. Tube drainage through stab-wound in flank. Considerable drainage containing bile-stained fluid.
November 20 discharged to Waverley Convalescent Home in good condition, with small sinus in the side.
Pathological report by Dr. W. F. Whitney; thick-walled cyst containing numerous small daughter cysts.
November 9, the echinococcus test was still strongly positive. Present condition good.

CASE 24. *Echinococcus cyst of liver.*
W. S. 204759.
Italian female, married, 44 years old.
Operated on by Dr. G. W. W. Brewster.
Admitted to hospital October 14, 1915.
Always well up to present illness. One year ago had severe pain in epigastrium, lasting several days. This pain radiated to the right shoulder. Six months ago had similar pain, and again 8 days ago. During each attack patient vomited and had fever. For the past 8 days has had pain every day; daily vomiting; jaundiced.
White count, 14,600. Differential count: polynuclears, 77%; small lymphocytes, 5%; large lymphocytes, 13%; mast cells, 5%.
Well developed and nourished. Eyes jaundiced. Abdominal examination shows extreme tenderness along costal border, otherwise negative. Patient had considerable pain the day after admission, requiring morphia.
Operation. Gall-bladder found distended. There was an irregular, cystic mass occupying much of

the liver substance. This was opened with the liberation of multitudes of small and large cysts, from the size of a pea to a golf ball. Foul-smelling, greenish material was evacuated from a deeper cyst. Cavity wiped clean; as much as possible of the lining removed; cavity packed with gauze. Gall-bladder rapidly removed. Considerable post-operative shock. Indirect transfusion for shock. Patient gradually failed and died on second day.

Pathological report of cyst removed: echinococcus cyst.

Autopsy No. 2511 showed evacuated echinococcus cyst of liver. Examination of removed gall-bladder showed nothing remarkable.

CASE 25. *Echinococcus cysts of the liver and peritoneal cavity.*

W. S., No. 193988.

Greek laborer, 22 years old.

Operated on by Dr. C. A. Porter.

Admitted to the hospital March 6, 1914.

As a child had attacks of pain in side, accompanied by fever. Seven years ago had pains in lower abdomen, lasting a week. Felt a lump in this region, which later disappeared. Two years ago had a similar attack and another lump in same area. Four and a half months ago had headache and noticed that he was yellow. Felt feverish. Nauseated at times. Felt fullness in epigastrium, and noticed a lump in this region. Jaundice lasted one month. Worked until two weeks ago, when he gave up on account of left-sided pain.

Well developed and nourished man. Mass felt in region of right kidney. Mass felt by rectum above prostate.

Preoperative diagnosis: hydatid tumor of liver.

Operation. Oblique incision from median line to lower rib margin, incising outer half of rectus muscle. A large cyst found involving right lobe of liver. Cyst also felt in pelvis, and left lobe of liver. Walling-off gauzes placed, cyst in right lobe opened, many small cysts evacuated. Sac marsupialized; packed with gauze.

March 29, secondary laparotomy, with removal of echinococcus cysts of sigmoid, rectum, gastrohepatic omentum and great omentum. A large cyst in the left lobe of the liver and in the region of the spleen not touched. Wound closed without drainage. Good convalescence.

Discharge to Waverley with old wound still draining. No subsequent note.

Pathological report by Dr. W. F. Whitney: echinococcus cysts.

CASE 26. *Echinococcus cyst of the brain.*

Mass. General Hospital, No. 299062, Out Patient Department.

Italian laborer, age 24. In this country two years.

Operated on by Dr. Harvey Cushing at the Peter Bent Brigham Hospital on December 4, 1913.

Positive findings: subjective, gradual loss of power of right arm for two months, loss of power of right leg for one month, paresthesia of right side of body and extremities, aphasia for past five days.

Objective: optic fundus: disc margin obliterated, disc region pale, lamina cribrosa and optic cup obscure, veins engorged and tortuous. Pupils unequal, right greater than left, both react to light and accommodation. Eyes slightly prominent. Definite right homonymous hemianopsia. Weakness of right facial muscles. Deep reflexes increased on right motor aphasia complete. Memory evidently markedly disturbed; he seems disoriented. Disposition very irritable when aroused. No dizziness or vertigo. Ataxia in both legs; right foot not brought up well from floor.

Differential count: polymorphous neutrophiles, 74%; eosinophiles, 7%; small mononuclear, 10%; large mononuclear, 9%.

Wassermann: spinal fluid and blood tests negative. Lumbar puncture, 3 c.c. clear fluid; no increase in pressure; count, 9 cells per cubic m.m. Globulin negative.

X-ray of skull, negative.

Dec. 4, 1913. Exploration from presumed tumor of left hemisphere. Surface normal. Aspiration of brain, evacuation of clear cystic fluid. Brain incised; three parasitic cysts found and removed from left temporal lobe.

Dec. 10, 1913. Removal of bone flap size of a pigeon egg; great cerebral tension.

Feb. 12, 1914. Aspiration of cyst in left hemisphere; 38 c.c. fluid removed.

March 3, April 29 and May 18, 1914, explorations with removal of more fluid each time. Died, June 14, 1914.

Echinococcus complement-fixation test, March 13, 1914, positive.

Post-mortem findings: Echinococcus cyst of heart and pericardium, including auricular walls; cystic formation of the lumbar cord; bronchopneumonia; chronic otitis media.

CASE 27. *Echinococcus cyst of liver.*

Mass. General Hospital, O. P. D., No. 224741.

Italian blacksmith, 49 years old, married. In this country eight years.

Past History. Pneumonia 11 years ago; for the past 11 years has had periodic attacks of acute pain in gall-bladder region, at times accompanied by vomiting and jaundice.

Present Illness. Three days ago had acute pain in gall-bladder region, which lasted 2 days and was accompanied by vomiting.

Well developed and fairly nourished; abdomen showed a slight prominence at the gall-bladder region, which on palpation appeared to be a smooth, round, tender mass of about the size of an adult male fist. Otherwise the examination was negative.

Operation November 20, 1913, by Dr. R. P. Bonnelli, in a private hospital. A cyst the size of a baseball, with a thickened capsule, was found springing from the inferior surface of the liver, mainly from the quadrate lobe. The encroachment of the cyst upon the gall-bladder and its ducts had probably caused the symptoms simulating gall-bladder disease. A needle was plunged into the cyst, and a clear, watery fluid aspirated. The diagnosis of hydatid disease was made, and later confirmed in the pathological findings. The cyst, along with the edge of the liver, which had been practically separated from the greater mass of the organ by the cyst, was removed *en masse*. Bleeding was controlled by catgut sutures going through the full breadth of the liver substance, and by warm salt solution. Considerable gastrohepatic fold, to which the cyst was adherent, had to be detached, causing a mechanical gastroptosis. This was remedied by suturing it back into place. Beneath the cyst, within the liver substance, was a cavity the size of a lime, which contained a necrotic membranous substance and a turbid serous fluid. This was thought to be a dis-

integrated hydatid cyst which had been dead and inactive for many years. The cavity was thoroughly swabbed, and the site of operation drained with rubber tubing. Outside of an unretentive stomach for the first 3 or 4 days, the patient made uninterrupted recovery, and on the 27th day was discharged in good condition, only requiring a protective dressing.

January 5 healing was complete. Patient in excellent condition.

CASE 28. *Echinococcus cyst of liver and omentum, and ruptured echinococcus cyst of lung.*

Service of R. I. Lee, No. 184560.

C. G.; male; age 27; married; Italian, in this country 15 years; fruit peddler.

Admitted to hospital Aug. 23, 1912, but refused to remain longer than one week.

Past History. In 1910 had a severe attack of pain in the epigastric region, centered at the ensiform. At this time first noticed a small swelling just below the ensiform. From then on, had similar attacks at irregular periods, depending on food taken, and accompanied by nausea and occasional vomiting. After 2 years the swelling had increased perceptibly and a feeling of fullness in the epigastric region, and shortness of breath on exertion developed.

Examination. Well developed and nourished; abdomen showed a prominence just below the ensiform, which moved with the liver on respiration. On palpation it was a smooth, doughy and tender mass, intimately connected with the liver. Liver dullness extended 3 fingers below the costal margin on the right side, and 4 fingers below the same margin on the left side, hinting towards the fact that the mass sprang mostly from the left lobe of that organ. The right side of the chest was dull from the inferior angle of the scapula down, and an occasional distant dry crackle was heard.

X-ray negative. Wassermann test negative.

Blood: 5200 white corpuscles; hemoglobin, 80%; coagulation time, 7 minutes. Stained specimen: polynuclears, 46%; lymphocytes, 51%; eosinophiles, 1%; transitional, 2%.

Diagnosis of echinococcus disease of the liver was made and operation suggested.

Operation Jan. 22, 1915, by R. P. Bonnelli, in a private hospital. On opening the peritoneum, a huge cyst was seen to spring from the entire inferior surface of the liver. It was adherent to the stomach, omentum, transverse colon, kidneys and spleen, and the gall-bladder could not be located at all. A series of 4 exogenous cysts, ranging in size from a hen's egg to a walnut, had thoroughly freed themselves from the original cyst and were adherent to the omentum. Three other exogenous cysts were adherent to the orignal cyst itself. These were carefully freed and individually removed *en masse*. Most all contained living scolices. The left lobe of the liver had most all been destroyed, the cyst filling its space. The wound drained profusely a sero-mucous fluid mixed with bile.

January 26 and February 10, echinococcus fixation test strongly positive. Patient was discharged in good condition on Feb. 13. The sinus on the right seemed to communicate with the chest cavity, for when the patient coughed there was an expulsion of air through the sinus. During the rest of February and March, the patient had a dry cough and vesperal fever. Sputum was negative for tuberculosis. Examination showed consolidation of the middle and inferior lobes. Patient expectorated large quantities of mucus, some brick red, other prune juice appearance. Examination of it showed hooklets of disintegrated scolices, and diagnosis of hydatid cyst of the lung made. Cough and expectoration decreased and disappeared in June. The sinus was completely healed in May. The patient felt fine.

Echinococcus fixation test Dec. 7, 1915, negative.

Patient well and working at present.

CASE 29. *Echinococcus cyst of liver.*

E. M. and E. S., No. 210334.

Albanian, age 28, married; comber in worsted mill; in the United States three years; male.

Operated on by Dr. F. G. Balch.

Admitted to hospital Sept. 5, 1916; discharged Oct. 11, 1916.

Past History. Born in Albania; lived there all his life until three years ago. Since boyhood employed on a farm as herder of sheep and cattle. Four years ago suffered from a slight pain in right lower chest when lying on that side. This lasted about one year. About one and one-half years ago, had attacks of pain about every two weeks in right hypochondrium after hard work. Pain lasted 5 to 10 minutes, relieved by rest.

Present Illness. Above condition continued until five months ago, when attacks came every 2 or 3 days, lasting 2 to 15 minutes. About same time swelling in right hypochondrium was noticed. Was then as large as now. Pain not severe, relieved by rest, but sharply localized and interferes with work. Has no relation to meals, and stays in same spot.

Physical Examination. Well developed and nourished. Heart and lungs normal. Mass in right upper quadrant, extending to level of umbilicus. Edge rounded, smooth and deep in abdominal cavity. Moves freely with respiration. No spasm, tenderness or other masses. Liver dullness from 4th space to 13 cm. below costal margin in right mammillary line. Edge palpable, surface firm and has several large rounded nodules, only slightly tender to palpation. Spleen and kidney not felt.

Blood: Sept. 6, white count, 5000; hemoglobin, 80%. Smears Sept. 5 and 9 show neutrophiles, 62 and 58%; small lymphocytes, 25 and 39%; large lymphocytes, 10 and 9%; mast cells, 2%; transitionals, 1%; eosinophiles, 2%; reds and platelets, o.k.; slight achromia. Sept. 7, Wassermann and echinococcus fixation tests negative.

X-ray No. 27640: Gall-bladder negative. Outline of left kidney distinctly seen, right not made out. Diaphragm high on right with limited downward excursion. Shadow of liver large, edge not distinct, marked tenderness over liver.

Diagnosis: echinococcus cyst of liver.

Operation. Sept. 12. Epigastric incision through right rectus muscle exposed large right hypochondrial fluctuant retroperitoneal tumor size of football, with sharp thin liver edge moving up and down over upper portion with each respiration. Rest of abdominal organs normal. Tumor tapped, one gallon of clear, colorless fluid removed. No daughter cysts. Cyst opened and explored, no contents found save a thick whitish translucent lining membrane with characteristic laminated structure of its outer layer. This removed with no resistance. The fibrous capsule of the cyst then cut down until normal kidney reached, proving cyst to be of upper

pole of right kidney. Kidney apparently all right. Wicks into kidney and peritoneal cavity at gall-bladder region.

Pathological report, Sept. 12, Dr. H. F. Hartwell: echinococcus of kidney. Blood: Sept. 13, white count, 5800; Sept. 22, 17,200; Sept. 28, 9200; Sept. 19, echinococcus fixation test negative.

Convalescence uneventful except for elevation of temperature without apparent cause.

Discharged relieved on Oct. 11, 1916.

STATISTICAL SUMMARY.

In these 29 cases of echinococcus disease at the Massachusetts General Hospital, the cysts were located in the liver alone in 16; in 5 cases other parts as well as the liver were involved, namely, peritoneal cavity twice, omentum, lung and kidney once each. In the other 8 cases the cysts were found in the brain, heart and pericardium once, kidney twice, peritoneum once, gastrohepatic omentum once, and retroperitoneal twice. In one case echinococcus cysts were passed in the feces, in another with the urine. Twenty cases were discharged relieved, one unrelieved and seven dead; operative mortality, 25%, six post mortems were performed. The ages of the patients ranged from 19 to 52 years, the average age being 32½ years. Twenty-two were males, fourteen of whom were laborers; the rest were peddlers, seamen, carpenters, farmers, blacksmiths and weavers. Eleven were Italian, 6 Greek, 3 Armenian, 2 Russian, 2 Irish, 1 Swede, 1 Icelander, 1 German, 1 English and 1 Albanian.

The first case recorded at this hospital was in 1875, the second case was in 1891. There were six cases in all prior to 1900 and 23 since then. There were 8 operative cases in the years 1914 and 1915. The increase of late years is significant.

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We are indebted to Dr. Harvey Cushing for the report of the very unusual case of hydatid of the brain. This case was treated in the Out-Patient Department of the Massachusetts General Hospital, but was later admitted to, studied and operated upon at the Peter Bent Brigham Hospital

We also wish to express our thanks to Dr. Raymond P. Bonnelli of Boston, former surgeon of the United States Army, for the reports of two cases which were temporarily treated at the Massachusetts General Hospital, but later came under Dr. Bonnelli's care and were operated upon by him.

MENTAL STATES RESPONSIBLE FOR MALINGERING.*

BY ERNEST B. EMERSON, M.D., BRIDGEWATER, MASS.,

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IN a general way, malingering is a deliberate attempt to shirk or deceive by pretending illness or inability, and should not be confused with the unconscious deceptions more or less frequently observed among intelligent and well-meaning people.

The importance of its detection or elimination may be far-reaching, involving either nominal damages or escape from a just retribution. As a rule, malingering presupposes an underlying motive which is more or less apparent, and should be looked for and considered in all suspected cases. The existence of a motive, however, has only an indirect bearing on the diagnosis, and is of far less value than a full personal and family history. It is only one point in a picture which must be viewed as a whole and from every angle.

The criminal, or one charged with crime, simulates disease or insanity to avoid the irksome restraint of the prison, or as a further means to

* Read at a meeting of the New England Society of Psychiatry, September 26, 1916.

accomplish an escape; the supposed victim of an automobile or railroad accident simulates for the purpose of winning damages, obtaining something for nothing; the hysterical girl simulates to attract attention and to gain sympathy.

Many attempts at feigning insanity, disease or injury are crude, and at once recognized, or at least suspected, while others are exceedingly clever and may hoodwink even the most experienced. This is especially so in cases simulating insanity among a population recruited largely from the prisons, and made up of individuals experienced in the ways of crookedness and oftentimes possessing a first-hand knowledge of some of the more common characteristics of mental disease. A host of offenders have as a fundamental basis of their moral obliquity a mental makeup deviating from that which we assume to call normal, variously estimated from 10% to 90%. It is probable, however, that the number may be approximated at 20 to 30%.

Feeble-mindedness is only a relative term, after all. The line of demarcation between the feeble-minded and those of us who assume intelligence, between responsibility and irresponsibility, is not sharply drawn, more particularly from the medical rather than the legal point of view. There is no real criterion. The diagnosis of feeble-mindedness, insanity, and the estimation of responsibility is more or less a matter of judgment, and opinions frequently differ. The several mental tests for intellectual development are of value up to a certain point, more particularly among juveniles. Among adults, however, there are factors demanding consideration other than the rating obtained by any of the recognized scales of measurement.

The family history, early training and environment, the worldly wisdom gained by experience, the ability to fit as an average peg in the social machine, are all phases of mental development, and not always measured by any of the recognized psychological tests. A man may rate 10 years of age by the Binet scale, yet hold an engineer's license, or serve several enlistments in the navy. Others may obtain an adult rating by the various mental tests, yet are lacking that balance or mental poise which places the average individual on a par with the rank and file of society, or enables him to keep out of trouble.

Malingering, or feigning of disease or injury, as seen in prison and hospital service, has varied from the most common complaint, the lame back or eye strain induced by weeding onions, to locomotor ataxia and deep dementia. The skill with which the deception is carried out varies with the intelligence and persistency of the individual. The detection of fraud in accident cases or simulated physical disease may or may not be easy. Much depends on the opportunity for observation and the relation of subjective symptoms to the conditions found by careful physical examination. A grave injury to the spine is inconsistent with unimpaired mobility of the spinal column, normal reflexes, proper functioning of other organs, unimpaired sensation or sensation disturbed in areas not corresponding to the seat of the alleged injury. Yet it is possible that any or all of these symptoms may be simulated for a time, and if there is a doubt or a difference of medical opinion, a jury may be inclined to believe the complainant, especially if the defendant happens to be a corporation or to possess a bank account. On the other hand, the layman is more inclined to believe an insane person charged with a capital crime is malingering than to accept a diagnosis of sanity.

The supposed motive to deceive may overshadow the more or less patent evidence of a real condition. Even the medical expert may be misled if he fails to consider carefully every phase and to weigh each bit of evidence without prejudice. A well-marked case of dementia precox charged with crime is readily recognized by the alienist. It is not so easy to recognize the border line or incipient case. He may be diagnosed as mentally sound or a malingerer, and later show by his conduct in prison that he was beyond doubt either feeble-minded or insane from the beginning, and should not have been stigmatized as a malingerer or criminal. On the other hand, the malingerer may succeed in his deception, thereby evading the dispensation of justice.

The simulation of disease and various forms of inability among a prison population has been observed invariably in those of sub-standard development or intellectually damaged. The motive has varied from a natural antipathy for honest labor to a fear of the electric chair, and there has been as wide a variation in the estimated degree of responsibility.

In some of the border-line cases there have been several periods of residence in the hospital and prison before the mental status was definitely settled. No two men react exactly alike under confinement in prison or hospital. A normal individual will adapt himself to either environment; another may appear normal under hospital conditions and yet be unable to adjust himself to the sterner life of the prison. Something is lacking. The prison officer will tell you that "he is not all there." These people are poorly balanced, lack resistance and consequently react badly to prison discipline. They become seclusive, suspicious, depressed and perhaps deluded, and are proper subjects for hospital care. These cases may clear up within a day or two of hospital treatment, yet they are true cases of mental aberration and not malingerers.

Another group, possessing to a lesser degree the same general characteristics with a substandard intellectual equipment, feign insanity for the easier life of the hospital, and frequently carry their point for a time. The general reac-

tions and conduct, however, are entirely different.

The first group as a rule presents an emotional tone and mood, conduct, powers of attention, judgment, reasoning, association of ideas and flow of language in accord with the content of their distorted imagination. The other group either overact the part or forget themselves in an unguarded moment, and finally admit the deception. It is then necessary to decide how far such a case shall be held responsible. Is the degree of mental defect still sufficient properly to classify in the hospital, or is it a case for the prison?

There is still another large class on the border line, neither insane nor feeble-minded in the ordinary sense, as judged by our present knowledge. They are anti-social, erratic, easily upset, impulsive, quarrelsome, lacking inhibition, easily led and influenced. They get into trouble, are detected, repent, take their punishment, and then forget or fail to profit by their experience. They may be exceedingly troublesome or, on the contrary, may adapt themselves to conditions in such a way as eventually to win a release. They do not hesitate to revile or bring false charges, and oftentimes in the most plausible manner. They are swindlers and liars, unstable and unreliable. Under whatever term they are designated, they are abnormal, social misfits; apparently something is lacking which the intelligence tests fail to reveal.

Pure malingering, the feigning of insanity without a psychopathic basis, is in our experience extremely rare. In fact, we have always felt that there was something the matter, whether or not we have been able to demonstrate a definite and tangible intellectual defect.

The following cases may be of interest as illustrating the more common types:

CASE T. A prisoner serving a term for drunkenness was observed by the officer to reel and stagger on his way to work. He complained of weakness of the legs and inability to walk because of vertigo. At first sight his gait somewhat resembled that of tabes, but it was noted that there was a fairly regular rhythm to the apparent incoördination. The pupils reacted to light and accommodation. The deep and superficial reflexes were undisturbed, and there was no Romberg symptom. Sensation intact. and no evidence of any paralysis. Inquiry revealed the fact that his trouble was worse when he was detailed for manual labor, and that he had been seen walking without difficulty. He was charged with faking. He was very earnest in his protestations of disability, and threatened to take his case higher up. On leaving the room he nearly fell down, but on reaching the stairs recovered himself, and, unaware of observation, walked down without the aid of a cane or the handrail. He had been an institution rounder for years, and without doubt had seen various types of nervous diseases and had observed, from his point of view, their easy life. He was a chronic alcoholic and, while not insane, presented the characteristic mental and emotional dilapidation of the drunkard.

Such a case might well collide with an automobile, and if directed by a clever lawyer, cause considerable trouble in the courts. The subsequent history has substantiated the diagnosis which, with sufficient opportunity for observation, was comparatively easy.

CASE C. J. A. Age 27; admitted Nov. 1, 1914; crime, carrying a revolver.

Medical certificate: "Statements mixed, appearance that of mental defective, behavior stupid. Becomes violent, has attempted suicide. Was inmate of Dannemora. Has physical marks of brain disease." Past history from patient: Ten years ago was in Central Islip Hospital. Diagnosis reported from this hospital, psychoneurosis, hysterical type. Discharged recovered. Committed to Dannemora State Hospital from Auburn Prison, October, 1913, and discharged October, 1914. Dannemora diagnosis, dementia precox. Believed to have delusions and hallucinations.

On admission to Bridgewater his general attitude was not in accord with the description in the medical certificate. He admitted having trouble all his life. Had served in several prisons. Shortly after admission, he admitted the deception, as he feared extradition on another charge. He was sent to New York, January 19, 1915. He later returned to Massachusetts and was sentenced to the State Farm prison for vagrancy. Shortly after admission he became seclusive, sullen and a loafer. One day he presented an abrasion the size of a quarter on the back of his hand as a reason for an excuse from work, claiming he had received it in a fit the night before. He finally admitted that he had abraded his hand to avoid work, and that a threat of suicide was a bluff. He was told rather emphatically that if he continued such conduct he would be committed as insane, and that a second commitment would mean a much longer time than the sentence he was serving. There was a right-about-face. From that day on he became a good worker, obedient, pleasant, and the question of insanity or physical inability was never again raised.

The past history of this patient shows him to have been unstable and anti-social from boyhood. The diagnosis of psychoneurosis at the age of 17 may have been correct; that of dementia precox, in view of his subsequent conduct, was probably wrong. Mental age by Binet scale, 11.6, and by the Yerkes point scale 15. Although defective to a degree, he was wise beyond the years indicated by the mental tests, and possessing a first-hand knowledge of some of the gross symptoms of insanity, he has been able to deceive, and choose for himself between prison and hospital.

CASE G. N. Age 21. Committed to the hospital August 24, 1911, from the jail, where he was awaiting trial for breaking and entering.

Medical certificate: "Muscular tremor, made an attempt at suicide, talks only to imaginary persons. Mutters to himself and seems to have delusions and hallucinations."

On admission to the hospital was nervous and disinclined to talk. Later admitted hallucinations at the jail, but had insight regarding them. Thought they were due to his morphine habit.

Discharged in six weeks, not insane; condition attributed to morphine. Second admission to the hospital August 13, 1913, from the Reformatory; discharged October 2, 1913.

Medical certificate states that he stopped work, complained of headache and inability to apply himself. He was silent, self-absorbed and answered questions with difficulty. Said other inmates were calling him names, that he had a fight with one, and that a prisoner ran after him with a knife. On admission, there was nothing in his general conduct or physical examination suggesting the emotional state or the delusions mentioned in the medical certificate.

He finally admitted the deception, and that he preferred hospital conditions to the restraint of the Reformatory.

Possessing a knowledge of the gross manifestations of insanity obtained during his previous commitment, for a short time he was able to act the part.

Although rating sub-standard by the Binet test, his knowledge and wisdom of the world were far beyond that of the average child of corresponding age, and he should not be judged on that basis. His subsequent history substantiates the diagnosis.

CASE S. Age 27, single. First committed to Bridgewater in 1901, at the age of 17, from the Concord Reformatory.

The medical certificate at that time stated that he believed eminent men in the state appeared to him at night and threatened him with false charges, that he was a graduate of Harvard, that he had killed two Chinamen who appeared at night, and that he threatened to kill an officer. While in the hospital he was exceedingly troublesome for several months and made several attempts to escape, in one of which he locked an attendant in his room, but was later captured.

Second admission to Bridgewater from State Prison September, 1912, where he was serving a sentence for breaking and entering. At the prison was a constant agitator, and was twice under observation as to his sanity. The medical certificate described him as tense, excitable, quarrelsome, and that he complained of the hostility of the officers, and that he was a victim of continual abuse because of his religious faith. On admission to the hospital he claimed he was "framed up" and that he had knowledge of morphine traffic in prison which would implicate many higher up. He made many absurd charges against the warden and chaplain, and claimed there was a conspiracy against him. He was an exceedingly troublesome patient—uneasy, abusive and threatening. He made an unsuccessful attempt to escape. Shortly before the expiration of his sentence there was a complete change in his general attitude and behavior. He became an exponent of law and order. He talked rationally concerning the conditions at the prison and admitted that his charges were based on gossip and that he never believed them. He was able to give in substance everything he had ever said or done, and his general attitude was not suggestive of one concealing delusions. He was held for several months over his sentence for observation, during which time his conduct was perfect. He was finally released to the care of his mother for a trial visit.

This man is not insane or feeble-minded in the ordinary sense. He is, however, unreliable, impulsive, erratic, vehement, inhibitionless and violent, and believes the world owes him a living. He has failed to profit by experience in the past, and will probably fail in the future. He was a malingerer and a psychopath. Whether or not he should be permanently segregated, the future must decide.

CASE W. F. Age 39; single; colored; considerably above the average intellectually. Studied law and later theology. Sentenced to state prison April 15, 1915, five to six years. Crime, assault with intent to murder; committed to Bridgewater April 26, 1915.

The medical certificate states that for 12 years he had been hounded by the police, that he had been followed all over the country, and that they had gone so far as to introduce an anesthetic under the door of his room. He had heard people talking about him at night and other people remonstrating and begging them to let him alone. He claimed that after his arrest he was most brutally and indecently assaulted in the presence of women and children. The landlady, with whom he had lived for four weeks, states that she considered him queer, and that he thought detectives were after him, and that she was in league with them. He accused her of harboring these people in order that they might chloroform and dope him. March 12, 1915, he broke the door of his room down, which had been locked for non-payment of rent. On the arrival of the police, with no warning whatever he made a vicious attack with a dangerous weapon.

In this case the motive to malinger overshadowed in the minds of the jail officials the evidence of mental disease. His past history, which should have cleared any existing fog, if considered at all, was entirely ignored, and he was stigmatized as a felon. He was diagnosed at the hospital as a case of dementia precox of about 12 years' duration.

A diagnosis of physical disease is based on subjective symptoms and the relation they bear to physical and laboratory findings. We expect to find characteristic symptom groups either confirmed or consistent with the objective signs of disease. The same holds true in a general way as regards mental disease. Subjectively, the patient has certain ideas or false sensory impressions which affect or influence his conduct, emotional tone, judgment, will power; in fact, his whole existence is modified by the mental turmoil.

As in physical disease, the various forms of insanity present more or less characteristic modes of onset and development; symptoms characteristic of several years' duration are not expected in cases of a few weeks' standing.

Objective signs are expected to be more or less in accord with the content of thought. The emotional life of a dement is dead, while that of one in communication with the Deity may be of exhilaration or depression. It is most difficult for the malingerer to act these parts for any length of time when unaware of observation. Either he fails to maintain the proper balance, or discovers that a continuation will profit him nothing. An apparently depressed, moody or self-absorbed attitude during an examination is not in accord with that observed a few moments later when among other patients, or with that maintained during a ball game. Sooner or later he becomes confidential with an employee

or another patient who, acting without suggestion, may give the first clue. Sham being suspected, it is, then, a matter of long-continued observation and possibly several periods of hospital residence before the mental status can be definitely determined.

A diagnosis of malingering should not be made until all reasonable doubt of insanity has been eliminated. Even then the underlying condition must be studied for proper classification. The constitutional defect may be of sufficient degree to classify in the hospital, or there may be a definite psychosis in the background.

The importance from the legal, social and medical points of view is equally great. To mistake a genuine psychosis for shamming is an injustice, and might happen to any of us. Although comparatively few mistakes are made by the experienced observer, the fact remains that the determination of the true mental status is oftentimes extremely difficult, particularly in criminal cases, and that judgment is not infrequently passed by those lacking qualifications and training.

I feel that in all instances of doubt, commitment to a hospital for the determination of the insanity, as provided for by statute, is most essential, not only for the protection of those truly insane, but for the elimination, if possible, of the malingerer, and incidentally for a study of the defect which is the fundamental basis of the deception. The latter may be of sufficient degree to absolve even the malingerer from being stigmatized a criminal.

TRAUMATIC INJURIES OF THE KIDNEYS.

BY FRANK WARNER, M.D., F.A.C.S., COLUMBUS, OHIO.

A young man, twenty-five years of age, was thrown against a cooking range at the time of a derailment of a rapidly-moving passenger train. In alighting, his back, in the region of the right kidney, struck the range. No special soreness resulted from the fall, but the next day he noticed blood in the urine. This was perceptible only for the one day, and then only in small amount. The following day he consulted me, but stated there was no longer any blood came away with the urine; however, an examination revealed, through the microscope, a small amount of blood present, and a little more than a trace of albumen in the urine. This condition of affairs continued for one week, when the trouble gradually subsided, having entirely disappeared at the end of ten days. Rest was the only treatment employed.

From the fact that the trouble so quickly subsided, one would be led to believe that nothing more than a contusion of the right kidney had occurred. None of the severer symptoms that go with more serious injuries of the kidneys was present.

Even these slight contusions of the kidneys must not be too lightly regarded. Murphy has pointed out the fact that any bruised tissue frequently becomes a prey to infective germs of one type and another. So, one needs a little time following these injuries to say with positiveness that no ill results will follow.

The purpose of the report of this mild case of traumatic hematuria is to call attention to the fact that slight contusions of the kidneys may escape observation unless care is exercised to diagnose them. It is not improbable that some of the injuries that are regarded as contusions of the muscles of the back have extended beneath the muscle walls to the kidneys themselves. While rest is valuable treatment for contusions of the muscles of the back, it becomes doubly important when the kidneys themselves are involved in the injured tissue. Besides, the complications which may subsequently arise, even in slight injuries to these organs, it behooves us to be alert and not overlook the true pathology which exists. This can be done if one will take the trouble to examine the urine, in addition to the back, at the seat of the contusion. Not until then can the diagnosis be correctly made nor the prognosis satisfactorily given.

Injuries to the kidneys are quite as apt to result where the violence has been sustained by the abdomen rather than the back.

What seems to be a slight contusion of the kidney at the time of the accident, may turn out to be a severe laceration of the renal tissue. Even after a severe injury to these organs, blood may not appear in the urine, for the time at least, owing to the fact that the ureter has been blocked by a clot of blood. Generally, however, this clot is soon passed down the ureter, frequently with the pain of a calculus moving in this tube. But there are other symptoms that point to the seriousness of the injury, and the situation of the blow received will indicate the probable organ involved.

All grades of injury occur to the kidneys as the result of accidents, from the mildest contusions to the severest lacerations.

It usually requires a very considerable force to injure the kidneys, owing to their protected position, situated as they are beneath the ribs.

Injuries of the kidneys that result from external blows, usually depend upon falls from a height, striking upon the back or abdomen, weights falling upon the patient, kicks of a horse, the ball of switch stand striking one on a moving train, crowding an individual between rigid moving bodies, as a train and platform; or, being struck by a pole of a wagon, hit by a base ball, etc.

If only a contusion of the kidney or kidneys results from the violence, a slight hematuria, without other symptoms, as in the case here related, may be the sole proof that injury has been sustained. Generally, however, pain in the lumbar region will be associated with the hematuria. Laceration of the kidney substance will,

however, give more pronounced symptoms, depending upon the extent of the laceration in part, and the amount of associated injury. If excessive hemorrhage is present, it will soon lead to unmistakable symptoms, frequently producing collapse, in addition to the other usual symptoms of concealed hemorrhage.

Shock is a prominent associate of severe kidney injuries, as might well be expected, for the severer kidney injuries have been inflicted by a force that has only partly expended itself on these organs, consequently other complicating injuries are present which adds to the shock of the kidney injury.

Anuria is frequently associated with the severer injuries of these organs.

Just as injuries of any part of the abdominal cavity give rise to nausea and vomiting, so here similar symptoms are present in lacerations of the renal substance.

Anywhere from a few days to a few weeks following the receipt of the injury, an elevated temperature, leucocytosis, and the presence of septic symptoms in general may announce the infection of the lacerated kidney. This frequently calls for prompt nephrectomy, just as a severe laceration of the organ may demand similar treatment.

In the milder cases of kidney injuries, rest is the sole treatment needed. Where they are more decisive, the entire situation must be canvassed, for an exploratory incision may be demanded to deal with the injured organ as necessity seems to dictate. It may be found that controlling hemorrhage and suturing the capsule will prove all that is necessary, but, on the contrary, one may find an amount of laceration of the kidney substance which demands a nephrectomy be done.

While contusions and superficial lacerations usually recover, the severer lacerations tend in the direction of death, either from hemorrhage or peritonitis, unless a nephrectomy is undertaken early enough to circumvent this untoward event. Even without operation, however, recoveries have taken place after the most extensive lacerations.

If a fatal result does not follow the shock of the injury, hemorrhage, or peritonitis, a later line of dangers comes along to complicate the prognosis. Septicemia, toxemia, urinary extravasation, cystitis, multiple renal or perirenal abscesses, etc., may arise to produce death unless measures are instituted to prevent it.

In an analysis of 67 collected cases of deaths resulting from traumatic injuries of the kidneys, Morris found 30 deaths due to hemorrhage and 27 to suppuration or subsequent infection. (Morris, vol. i, p. 179).

Kidney lacerations and contusions are often associated with other injuries, as might well be expected from the amount of force that is frequently expended on the patient receiving them. Fracture of the neighboring ribs, with a fragment jabbing into the kidney, a fractured spine, or rupture of the liver and perhaps some other abdominal organ, is a not uncommon occurrence in these injuries. Such complications were present in twelve out of seventeen deaths from kidney lacerations collected by Keen. (Vol. iv, p. 214).

In looking over the literature, it is evident that no one surgeon sees many cases of severe injuries of the kidneys. Out of 7741 injuries of all types, Kuster, in his clinics at Basel and Berlin, only encountered ten cases of lacerated kidneys. Of 2610 autopsies, he found 13 injuries of the kidneys, one a penetrating wound. Three of these cases were evidently encountered after death, as they are not included in the cases of injuries treated or diagnosed in his clinic.

Kuster showed, experimentally, that many lacerations of the kidneys were the result of hydrostatic pressure.

Ransahoff quotes Delbert's collected statistics of 319 cases in which 225 were not operated upon, with 103 deaths. Fifty cases treated by suture, packing, or partial nephrectomy, 2 deaths occurred. In Watson's 273 collected cases unoperated upon, 81 died. In 93 cases treated by conservative operations, 7 died. In 115 nephrectomies, 25 died.

Connell reports five cases of kidney laceration operated upon by him, four of a mild subparietal type and one severe. The four mild cases recovered; the severe injury was not operated on until ten days after the recipt of the injury, and the patient died.

To know when to operate on an injured kidney is always a difficult, and frequently uncertain, matter. But Keen has shown that only half the danger exists in operating on the kidney early, that obtains later in the history of the injury. When a hematuria continues, a hematoma forms in the region of the kidney, and if it seems to be increasing in size, together with symptoms of concealed hemorrhage, it is far better to operate then, under good conditions, than wait until the risk is greatly increased. Even if the hematoma spoken of does not appear, the hemorrhage that is taking place may be dissecting up tissues for a considerable distance, when the evidence of concealed hemorrhage must take the place of evidence of a hematoma. To wait too long only makes the prognosis more grave. Under modern aseptic precautions the danger of an exploratory operation on the kidney is not great if it is undertaken before too extensive hemorrhage has occurred or septic infection has taken place.

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OBSERVATIONS ON MEASLES.

BY D. M. LEWIS, M.D., NEW HAVEN, CONN.,

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AT the present time it is generally held that the only control over measles lies in the isolation of each case during the period preceding the eruption, namely, during the head cold period. Unless measles is epidemic, a diagnosis or probable diagnosis will be made but rarely during this period when contact exposure is assumed to be greatest, and for that reason control over measles is frequently held to be impracticable. Again, even Metropolitan Boards of Health are sponsors for the non-infectiousness of convalescent measles to the extent that after the disappearance of the rash, school children may be returned by certificates dated ahead or from the certificate of the attending physician. My previous field studies on diphtheria and scarlet fever showed that control over these diseases meant control over convalescent carriers and the self-inoculated carrier who had never had the disease. With a demonstrable control over those diseases, I have studied a series of cases of measles during a prevailing epidemic to learn why analogous procedures to those I have found in the other diseases should not hold in measles, or why present-day procedures do not control the disease.

In that measles is notoriously a poorly reported disease, my measures for obtaining every possible case occurring were the following: As with the other major communicable diseases, I made it a rule that all children in houses where there was a case must obtain a school certificate, which gave me unreported cases in other families, as well as some observation of possible carriers. Secondly, my system of absentees from school, as described previously by me, gave me possible unreported cases or missed cases. Lastly, requiring my certificate for admission to school after the disease, as against that of the attending physician, gave me unreported cases, as well as observations on the cases when well. That I obtained data on practically all cases occurring seems probable in that the usual 2% mortality recorded as low is expressed in the present epidemic as 1%.

My observations were made on 287 primary cases and 49 secondary cases occurring in 239 families from the time the premises were placarded until the card was removed. Of these cases, 73 primary cases were not reported. My rules called for notification to the board of health by the householder when, any time after ten days to two weeks, their physician, or failing employment of one, they considered the patients well. Until the card was removed, the other members of the family, especially children, should not come in contact with those previously sick. That such new stuff did not go even with intelligent individuals, was evidenced by the infrequency with which we met with instructions carried out, but rather with the frequency with which the one previously ill was not on the premises when I was notified that they were well. This was especially fortunate for gaining observations, in that of the 49 secondary cases, 25 had an incubation period of ten, eleven or twelve days regularly, while 24 had an incubation period of from eighteen to twenty-one days. That these latter cases were not exposures during the head cold period of the primary case was apparent by both the incubation period, and the fact that the one previously sick had been declared well after the first few days, coupled with the fact that the secondary cases were younger children of the family in neighborhoods where all the primary and missed cases were of the same school age. The points that confirm the presumption that these primary cases were carriers of convalescence are the following: forty-three of these cases were held in isolation for one week beyond the usual two-week period before the tongue had assumed a normal appearance, as well as for the subsidence of the edematous throat. There were an additional 24 cases where the mentioned condition of the membranes did not return to normal for from four to six weeks. There were an additional 5 cases who had, besides these signs, a unilateral nasal bleeding with skin excoriation in no wise differing from diphtheria carriers, save in the absence of the organism. There were, as well, 2 cases with discharging ears who showed the inflamed membranes of the mouth and throat. In one remote neighborhood, with previous absence of the disease, one such carrier was held for two weeks after being declared well, because of the buccal-pharyngeal signs. The parent was openly amused by my warning that the patient could infect at that time a younger susceptible sister, was indignant at my refusal to remove the card on a second visit one week later, yet almost penitently informed me that that same sister had come down with the disease just previously, at my third visit the following week. The only two cases in a ward in the opposite side of the city were both traceable to visiting relatives in the infected area while a card was on the house, although they considered themselves well. A well-marked instance was the reporting of two infants as cases where no contact could be found at the time. Ten days later, when well, I found at the house for the first time, the brother, who was a school child, who had never been sent out for a permit. He had had measles two years previously and had now an excoriating, bleeding, unilateral nasal condition, as well as a naso-pharynx, which was in no wise dissimilar from a measles tongue. He was isolated for some ten days before the mucous membranes were normal. During that period and for some weeks following, there were neither further cases in the neighborhood among infants, nor were there cases among children of

the same schoolrooms where there had been a number of cases appearing after the family had been reported, for a period including upwards of one week after he was isolated. I was asked to see a suspected case of scarlet fever in a boy who three days previously had had a scarlet fever eruption. In the absence of anything suspicious about the throat or tongue, other than a slightly edematous throat and a clean tongue, with the fact that there were measles cases in the boy's room at school, I advised the family to isolate him for a week or ten days as a mild measles in one who had had them some years previously. One week later a younger brother in the family and a boy of similar age in another family in the house were evident cases.

There is, then, sufficient evidence to justify isolation of all cases of measles, from susceptibles until the inflammation of the throat and tongue has entirely subsided. The demonstration of a normal tongue in a convalescent measles case and the tongue of the carrier, though both cases may have had the same date of onset, is sufficiently characteristic to be appreciated even by the laity. As with scarlet fever, discharging ears and desquamation are rarely finished before the return of a normal mucous membrane of the naso-pharynx, including the mouth. How successfully effective my attempts at controlling these carriers of convalescence is, can be measured at the end of the year in comparison of the number of cases in the community during the epidemic, as contrasted with our neighbors who had their 1500 and 2000 cases the year past, as well as the success in the prevention of a similar epidemic in the other eleven wards of the city, as has been going on for the past three months in three wards. There is one positive measure, as shown by an increased school attendance for each of these three months over the previous year, and that increase beyond the increase of gain of school scholars over the previous year, despite an epidemic of measles from which the city was free during the previous year.

On the diagnosis of measles there is one point that is not given sufficient attention by physicians. There is a frequent preliminary erythema a day or even two days before the characteristic rash, which led to the diagnosis of scarlet fever in 4 of these cases. In the presence of such a rash the Koplik's sign, as well as the general condition of the mucous membrane of the tongue and throat, should warn against a too immediate diagnosis.

In the light of my previous experience, a frequency of German measles during the present measles epidemic shows that disease to be a true "grippe" with a measley rash. Characterized by the absence of the typical measles conjunctivitis, the absence of Koplik spots, by the presence of the more general cervical low-grade glandular enlargement, the general free perspiration or sweats, I have been more impressed with the confirmation of the diagnosis in the other members of the family. It has been the rule that with German measles in the older children, the younger children who have had neither measles nor German measles escape both during and following the illness, but in every member of those younger children, one will have had a bronchitis, one a tonsillitis and one just plain "grip." Physician and family alike remark how extraordinary it is that the youngest who were exposed to the German measles did not take it. German measles, Dukes' disease and the Fourth disease may all be listed as either "La Grippe," or, in some instances, a missed measles or scarlet fever.

CONCLUSIONS.

Attempts to control measles must recognize carriers of convalescence; they may be recognized by the inflammatory condition of the mucous membranes of the nose, tongue and throat.

German measles is not a diagnosis, and as such is unnecessary in medical nomenclature. It is either true measles or true grippe.

Book Review.

Gynecology for Students and Practitioners. By Thomas Watts Eden, M.D., F.R.C.S., F.R.C.P., (Temp. Major, R.A.M.C.) and Cuthbert Lockyer, M.D., B.S., F.R.C.S., F.R.C.P.; with 513 illustrations and 20 colored plates. New York: The Macmillan Company. 1916.

The object of the authors of this book has been to "set forth a comprehensive account of the special diseases of women" and in order to "keep an even balance between the pathological and clinical aspects of the work" collaboration between two writers has been employed advantageously.

The illustrations are abundant and clear. The classification of general gynecology, regional gynecology and operative gynecology has been adopted for its usefulness in clinical work and in teaching, rather than on account of any logical basis. Knowledge of obstetrics forms an essential part of the training of a gynecologist and in this work attention is paid to the overlapping of the two subjects.

The result is an unusually well balanced book, up to date yet conservative; giving the newer views but cautious when evidence tends to yield to theory. The style is clear and direct and the tone throughout is scholarly. The index is excellent, but the book lacks a bibliography.

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STREAM POLLUTION.

ONLY after a great deal of abuse of the inland waters of this country is there an awakening to the great economic and sanitary burden uncontrolled pollution is placing upon the public at large. Investigations carried out by Dr. Allan J. McLaughlin of the United States Public Health Service, as well as the International Joint Commission (Pollution of Boundary Waters), have done a great deal to bring the matter definitely before the public. There has been, however, so much conflicting legislation among the States, and so many confusing judicial decisions and views of this condition, that no rule as to the degree of pollution permissible can be formulated which shall be binding everywhere. While the tendency previously has been to view the utilitarian—and particulary the degree of utilitarian—uses to which the stream must be put because of some particular industrial or communal need, as the index of the degree of permissible pollution, there is now, fortunately, a tendency to make the degree of pollution dependent upon the amount consistent with the sanitary and even the esthetic considerations of the communities concerned, and not entirely upon economic advantages of any one community. On the other hand, it never was intended that waterways be kept in pristine purity. That is neither possible nor desired in inhabited communities. Water, and especially flowing water, can take care of a good deal of pollution. There is a tendency to much self-purification. This question is intended only to reach pollution of extraordinary degree, which so overburdens the stream at one period that it cannot free itself. It imports a large degree of selfishness, to say the least, for a community above a stream to solve its problem of sewage waste at the expense of a community below. When water will cause disease in a community consuming it, or will infect or destroy marine life in it, the degree of pollution must be extreme indeed. When typhoid is carried in water, it is a sign that colon infection must be very large. With ordinary or permissible pollution this is not likely to occur, because in exposure in so poor a medium as water, and in the dilution in which it can reach the consumer, the bacillus cannot be a factor in the transmission of this disease. The infection of oyster beds occurs in polluted streams particularly, either because there is so high a degree of pollution, or because—which is the more likely—the beds are situated where they catch the sewage in a fresh and concentrated form.

Supplying its inhabitants with safe potable water is one of the corporate duties of a community. Individuals or their kin have been awarded money damages where a municipal corporation has failed in this duty, and disease or death resulted. The general health condition of a community is so much within the control of the community that this liability should extend to any disease when it reaches epidemic proportions. The community has a duty to supply a health organization on the same scale and with the same proportionate expenditures as it supplies the material wants of its inhabitants.

In the last war in which this country was engaged, flies and polluted water caused the major portion of the casualties among the soldiers while in training camps in various parts of the country and before they reached the field of

operations. In this war, where a much larger number of military units must be raised and trained in various camps, it will be quite important to safeguard the water supplies of the localities where such camps are to be located. No amount of antityphoid care can be as beneficent as the maintenance of pure water and food supply.

HEAT AND INFANT MORTALITY.

THE high rate of mortality among infants during the summer months, especially among the poorer classes, is a problem that is continually presenting itself to the profession at the beginning of the hot weather. That part of the summer infant mortality that is properly placed at the door of contact infections from flies, from dirt, and from bad milk, while very large, is gradually resolving itself, through appropriate milk legislation, fly-extermination campaigns and general education. Yet there is undoubtedly a great deal of infant mortality which is the result of conditions outside of these factors, and is directly due to temperature, lack of adequate ventilation and generally poor housing conditions.

In general, it can be said that hot summers have an abnormally high infant mortality, while the cool summers have the reverse (Schereschewsky, Public Health Reports, No. 155). This is a reversion again to the old belief that heat is a direct factor, although it was believed more recently that heat merely enhanced and allowed the better action by bacterial and other deleterious agents. Indeed, so much of the death rate during the hot weather is accompanied with gastro-intestinal symptoms that it is hard to dissociate the conditions. There is a high early summer mortality and a late summer mortality. The deaths in the early summer are accompanied with rather acute symptoms of short duration, and not usually referable to the gastro-intestinal tract, but rather to the central nervous system, and would appear to be the direct result of the rise of temperature. The late summer mortality is, however, usually accompanied with gastro-intestinal symptoms, chronic in nature. Death results after long-standing illness, and very often a considerable time after the drop in temperature. It would appear, therefore, that, while the deaths in the early part of summer were caused directly by heat, those in the late summer were the indirect results. It must, nevertheless, be observed that the outside temperature is no index of the indoor temperatures in the homes of the poor. Indeed, Flugge found that among the poor the mean indoor temperatures might exceed the mean outdoor by as much as 9.5° C. He found, further, that with outdoor temperatures ranging from 21° C. to 23° C. there were indoor temperatures ranging from 35° C. to 37° C. These temperatures are much increased for the child by excessive clothing, rubber diapers, house heating, congestion, etc. Almost any temperature outdoors is better for the child than the indoor conditions. It fully justifies the outdoor and fresh air treatment advised for these infants when they suffer the direct or indirect effects of the hot weather. Liefmann found that the heat effects were not initiated except when the temperature rose above 24° C. He found that children living in basements and cellars had a lower mortality than children in the same environment, only because of the lower temperatures obtaining in these underground dwellings.

Where air had free access to the houses, the mortality was lower than where it had not. The free circulation of air tends to lower the temperature and proves of general benefit in the reduction of infant mortality. Prausnitz found that in respect to ventilation and the free circulation of air, infant mortality ranged from 15% where houses allowed of thorough ventilation, to 65% where ventilation was woefully lacking.

RECONSTRUCTION HOSPITALS.

ONE of the problems which is ever present, but which will become more acute during the present war situation, is the reëducation of the maimed and disabled patient to enable him to return to his place in the community and, in spite of his handicap, maintain himself in leading a useful life. The work of repairing shattered bones and supplying mechanical devices for missing members falls naturally in the field of the orthopedic surgeon. The Government, in recognizing this, has arranged for the establishment over the country of reconstruction hospitals where the newest and most approved methods known to orthopedic surgery and mechanical appliance, will be practised for the benefit of the crippled soldier, to fit him to fill a useful and self-supporting place when he returns to civilian life.

As the first step in organizing these reconstruction hospitals, the Government has commissioned Dr. Joel E. Goldthwait as Major and has sent him to England and France on a tour of inspection of the orthopedic hospitals there to observe what is being done there for the care of cripples. Dr. Goldthwait sailed for Europe this week and with him went a unit of surgeons who will be detailed in English reconstruction hospitals under Colonel Robert Jones. The following men will be commissioned with the rank of Captain: Dr. W. G. Erving, Washington, D. C.; Dr. C. R. Metcalf, Concord, N. H.; Dr. W. I. Baldwin, San Francisco, Cal.; Dr. A. R. MacAusland, Boston, Mass.; Dr. De Forest P. Willard, Philadelphia, Pa.; Dr. H. Winnett Orr, Lincoln, Neb.; Dr. S. M. Cone, Baltimore, Md.; Dr. M. S. Danforth, Providence, R. I.; Dr. C. F. Eikenbary, Spokane, Wash.; Dr. Roades Fayerweather, Baltimore, Md.; Dr. F. C. Kidner, Detroit, Mich.; Dr. Wallace Cole, St. Paul, Minn.; Dr. J. C. Graves, Spokane, Wash.

Those given the rank of Lieutenant are: Dr. R. C. Abbott, San Francisco, Cal.; Dr. Mitchell Langworthy, Chicago, Ill.; Dr. Louis Cass Spencer, Baltimore, Md.; Dr. H. A. Durham, New York; Dr. C. L. Hall, Washington, D. C.; Dr. Robert I. Johnson, Baltimore, Md.; Dr. R. Wallace Billington, Nashville, Tenn.; Dr. J. C. Wilson, Hartford, Conn.

Before his departure, Dr. Goldthwait planned the organization of a reconstruction hospital on Parker Hill, Roxbury, Mass. It is proposed to build at once four wards of twenty-six beds each, at a cost of $3000 a ward. This does not include equipment, which will come from the Government and the Red Cross. Heat and light service will be supplied by the Robert Bent Brigham Hospital, in conjunction with which the Reconstruction Hospital will be operated. The treasurer of the fund for building the Hospital is Charles S. Rackemann, and up to the present time nearly $3000 has been pledged. Dr. E. G. Brackett will be in charge during Dr. Goldthwait's absence.

When Dr. Goldthwait returns from abroad he will go over the country and establish similar hospitals in the leading cities, based on his knowledge and experience in the requirements of this new and most vital phase of medical service.

MEDICAL NOTES.

WOMEN PHYSICIANS AMONG THE VIKINGS.—The issue of the *British Medical Journal* for January 20, 1917, quotes a paper on "Women Doctors of the Viking Age," read at a meeting of the Viking Society for Northern Research on January 6. The period referred to includes the time from the eighth to the tenth centuries.

"A good deal of the doctoring of the time was connected with a belief in witchcraft, and a remarkable figure in one of the sagas is Brynhild, the valkyr or handmaiden of Odin, who dwells on a mountain, and is said to be a wise woman, skilled in magic, pharmacy, herbalism, and the binding of wounds. A hint as to the character of the pharmacy is to be obtained from the 'Song of Laws,' where various specifics are mentioned, such as oak against binding of the bowels, spur of rye against hernia, and neather against biting sickness. Many of the women who practised as leeches received merely a passing mention in the tales. There are some vague references to midwifery and leechdom in the great Icelandic prose 'Edda'; and in the 'Vassorfirdinga Saga' the leech Thorvardr makes her appearance to heal the men's wounds after battles; and, again, in the saga of 'Olaf Tryggvason' it is told how Olaf I of Norway (969-1000) having received two serious wounds—one from a stone and the other from an arrow—at the disastrous sea battle of Svöld, sought the help of Astrid, the woman leech, and remained with her until he was cured. But the most vivid of all the narratives is that contained in the saga of 'St. Olaf the Holy,' where the woman leech is introduced, cleansing the wounds of the fighting men with warm water. To her comes Thormod, the warrior poet, who explains his lack of ruddiness by the arrow which has lodged in his side:

> It was darksome metal,
> Driven by main, flew through me;
> The perilous sharp iron
> Bit nigh the heart, ween I.

Thormod having cast off his clothes, the leech examines the wound, and finds iron standing therein. There was already in the stone kettle a mass of leeks and other herbs, which, sodden together, were given wounded men to eat, in order that the leech might divine the extent of the internal mischief by discovering whether the leek smelled out through the wound or not. But Thormod refuses to take the concoction, preferring immediate recourse to some primitive surgery. The leech takes the gripping tongs in the attempt to draw out the iron, but it is too deeply embedded to stir, and she cannot get sufficient purchase, owing to the swelling of the part. Then Thormod bids her shear close up to the iron so that it be well caught by the tongs, and he will pull it out himself. This the leech does, and Thormod, having first thoughtfully paid his fee in the shape of a gold brace-

let which he detaches from his arm, takes the tongs and pulls out the arrow, on the barbs of which lie sinews from the heart, some red, some white; after which exertion he sinks back and is dead. A derivative of the Old Icelandic *laeknir*, meaning leech, is said to be still the only word in Iceland for doctor. Etymologically, the word in this sense is not, we believe, derived from the name of the animal, but is related to a Norse verb meaning to heal, and it has been suggested that the animal got its name because it was used by healers, 'leeches.' "

THE AMERICAN THEATRICAL HOSPITAL.—There has been opened in Chicago a hospital where sick and indigent people of the stage and other branches of the amusement field may be cared for. It is to be called the American Theatrical Hospital.

MEETING OF NATIONAL TUBERCULOSIS ASSOCIATION.—At the recently held annual meeting of the National Association for the Study and Prevention of Tuberculosis a strong protest was made against the United States Government assisting patent medicine concerns in the exploitation of China. A resolution was framed which was particularly aimed at a special consular report issued by the Department of Commerce in March which, it is said, urged patent medicine interests of this country to exploit China and the Chinese people.

The resolution condemned this action of the department and urged that hereafter the influence of the United States Government should not be used in support of the patent medicine business. Resolutions were also adopted pledging the support of the Association to the American Red Cross in promoting Red Cross work in any form. At the same time public health nurses were urged to continue in their present fields of activity, owing to the fact that their special training in tuberculosis work and other special public health endeavor is particularly needed at this time to combat disease and social problems created by the war.

The Association also declared in favor of national prohibition for both soldiers and civilians during the war period and for one year thereafter. Colonel Theodore Roosevelt and Sir William Osler were elected honorary vice-presidents. Other officers were elected as follows:

President, Dr. Charles L. Minor, Asheville, N. C.; vice-presidents, Dr. Frederick L. Hoffman, Newark, N. J., and Dr. David R. Lyman, Wallingford, Conn.; secretary, Dr. Henry Barton Jacobs, Baltimore; treasurer, Dr. William M. Baldwin, Washington, D. C.

A committee of three was appointed to arrange plans for dealing with the important matter of tuberculosis in the future army of the United States.

AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—The annual meeting of the American Medico-Psychological Association will be held in New York City on May 29, 30, 31 and June 1, 1917. Hon. John P. Mitchell, Mayor of New York, will give the address of welcome. The morning of the first day will be occupied with the address of the president and reports of various committees. The following days will be given to the reading of papers from many well-known men in this particular field of medicine. On the afternoon of June 1, the Hon. Carl Vrooman, Assistant Secretary, United States Department of Agriculture, will deliver an address upon the food situation in this country, resulting from our participation in the "World War."

The question of having all state institutions throughout the country make an earnest endeavor to become self-sustaining as far as their food products are concerned will be discussed. Our country is entering a very critical period in its history. The successful termination of this war depends almost entirely upon the ability of the farmers to grow sufficient crops to feed not only our own people, but the greater portion of Europe. This is a stupendous task and will require the most careful management and intensive development of the agricultural forces of this Nation. If our institutions make a special effort to grow all or a part of their food supplies, it will be an important factor in relieving the situation. The intensive cultivation of every foot of arable land on hospital property, the purchase or rental of adjoining land, for agricultural pursuits; the conservation of all winter vegetables; the occupation of the greatest number of patients, both men and women, on the farm; the purchase of stock and agricultural implements, which will enable the hospitals to develop their resources to the limit are all questions of primary importance and will be discussed at this meeting.

In an emergency such as this country is facing, legislatures and boards of control will, no doubt, make special efforts to finance and cooperate in every way with our state institutions when they realize the important part the institutions can take in helping solve the food problem. Members are requested to come prepared to make brief reports on what is being done at the present time at their respective hospitals and make suggestions that may be helpful to others.

ST. LUKE'S HOSPITAL, NEW YORK.—It is announced that on May 21 St. Luke's Hospital, New York, opened a new ward of 30 beds for the free treatment of men rejected from military enlistment for minor and remediable physical defects. It is estimated that the cost of this service will be about $2000 a month. It will be maintained for the duration of the war.

WAR NOTES.

EARLY SURGICAL TREATMENT OF GUNSHOT WOUNDS.—In the issue of the *Lancet* for February 17 is published the following item relative to the invention of the rapid firing gun and the early surgical treatment of the severe wounds produced by the early quick-firing harquebuses.

"It must be more or less an accident that we have not got in early English surgery ample accounts of gunshot wounds. The quick-firing hand gun seems to be such a modern invention that it is curious to find that it is really 400 years old, and that a King of England so closely connected with medical men as Henry VIII should have been interested in the invention. In the little known *Chroniques des Iles de Jersey, Guernsey, Auergny et Serk*, it is related how:

Hellier De Carteret, Bailly de la dite Isle de Jersey, se transporta vers le Roy Henry VIII, auquel il remonstra le grief et injure que le dit Sire Hugh Vaughan, Capitaine de la dite Isle, luy avoit faite en Cour séante, et comment le Roy luy confirma sa patente, touchant son office de Bailly soubs le grand Sceau d'Angleterre durant sa vie, et aussy le fist son Serviteur et Escuier tranchant, dont le dit Bailly fut sermenté solemnellement ainsy qu'en tel cas est réquis et accoutumé. Et avecq cela le Roy donna congé et licence au dit Bailly, de tirer tant de la harquebuse que de larcbaleste en quelque endroit que ce fust en tout le Royaume d'Angleterre, tant augibier que es bestes sauvages sans aucunement en estre réprins ni destourbé d'aucun durant sa vie; et de ce, luyen fist bonne asseurance soubs son privé signe. Et fut le dit Sire Hugh Vaughan, Capitaine comme dit est, envoyé quérir, par un Héreault d'armes en toute haste.

This giving by the King of a license to use the harquebuse—the original hand gun—was an exceptional privilege, as the British archers were thought highly of and encouraged.

The next few lines relate the invention by Hellier De Carteret of a quick-firing harquebuse, which would also aim in two directions at the same time, and King Henry VIII's interest therein. The greatest improvements in the harquebuse are generally credited to Filippo Strozzi, an Italian, in the year 1530.

Le dit Bailly estant ainsy parvenu en la faveur du Roy par le moyen des Seigneurs du Conseil, et aussy que le Roy se délectoit fort à tirer tant de larcbaleste que de la harquebuse, pouvoit ordinairement aller avecq le Roy quand il alloit tirer en quelq'un de ses Parcqs fust es bestes sauvages ou autre gibier; et mesmément pour autant que le dit Bailly avoit trouvé une invention de tirer de sa harquebuse 5 ou 6 traits de boulez l'un après l'autre et à plusieurs marques toutes d'une même charge l'une avant l'autre et d'un mesme feu, et aussy de son arcbaleste tirer deux vires tout d'un coups, l'une d'une voye et l'autre de l'autre et à deux marques. Le Roy voulut scavoir et apprendre la dite invention et l'expérimenter et pratiquer luy-mesme, à quoi il y print un fort grand plaisir, tellement que le dit Bailly fut de plus en plus en la bonne grâce et faveur du Roy.

The wounds produced were so severe that a distilled aromatic spirituous liquor termed 'harquebusade' came into use for treating the shot wounds, and its composition was altered from time to time, according to experience or fancy. The Seigneurs of St. Ouen, Jersey, have for so long a time been named De Carteret, that Philippe De Carteret, who was the Seigneur in 1585, was the fifty-ninth Seigneur of St. Ouen, and the claim has been made that it would be difficult to find a race so old and direct in any kingdom."

OFFER OF HOSPITAL AND YACHT TO GOVERNMENT.—Mr. Albert C. Burrage, who for some years has supported the Burrage Hospital on Bumpkin Island, Boston Harbor, as a hospital for sick and crippled children, has offered the hospital with his steam yacht *Aztec* to the Government to be used in the care of sick and wounded sailors. The buildings on Bumpkin Island will accommodate two hundred beds with quarters for the staff and help. The *Aztec* is the largest steam yacht, with one or two exceptions, on the Atlantic coast, and is now being put in commission. Mr. Burrage has expressed willingness to support both hospital and ship, the former up to $4000 a month and the latter up to $8000 a month, for a period of at least four months. In his letter to the Government he expressed himself as follows:

"Hon. Josephus Daniels, Secretary of the Navy,
Washington, D. C.:

Sir—Bumpkin Island is a beautiful island of about forty acres lying in Boston harbor, midway between Hull and Hingham, and upon this island is located the Burrage Hospital, which is devoted to the free care and treatment in summer of sick and crippled children. This hospital was built by myself, and is operated by the Burrage Hospital Association, which is wholly supported and officered by myself and my immediate family.

This hospital, besides the rooms for the staff and help and the smaller rooms for patients, has eight wards, each capable of holding about twenty-five beds, and the location and character of the hospital is such that, in case of war, it would be accessible and most suitable for the care of those in the navy who are wounded or ill.

The steam yacht *Aztec*, with a length of 260 feet over all and 216 feet on the water line, and a beam of 30 feet, was built by myself as a pleasure yacht for myself and family, and has never been used for any other purpose. It was specially designed and fitted up for a family pleasure boat and not for rough usage. I used

the boat for four months last summer, and it is now being overhauled at Greenport, L. I., for my use this summer.

The character of this yacht is such that it would be most suitable for a hospital transport boat to take men from naval ships on the New England coast to a land hospital such as the Burrage Hospital. In case of war being declared in the near future between the United States of America and some European nation, I beg to offer the United States Government the free use of the Burrage Hospital during the war, for the use of the naval forces of the United States, and also hereby agree that in case of such war, I will personally pay the expenses of the operation of the hospital as it now is, up to four thousand dollars per month for at least four months from the beginning of such war; and the United States Government may erect such other structures as it wishes upon the island, and may, at its own expense, continue, during the war, the operation of this hospital after such period of four months; it being understood that the Government will keep the hospital in good order and repair, keep it fully insured and return it at the close of the war in as good condition as it now is.

I also beg to offer to the United States Government the free use of the yacht *Aztec* as such a hospital transport ship for carrying, within the first district, *i.e.*, from Chatham to Eastport, the sick and wounded men of the United States Navy to and from the Burrage Hospital for such period of four months from the beginning of such war; and I agree that, in case of such war, I will personally pay the expense of the operation of such hospital ship as it now is, up to eight thousand dollars per month for at least four months from the beginning of the war; and the United States Government may, at its own expense, during the continuance of such war, after said period of four months, operate said yacht as such hospital ship without compensation to me for the use of such boat, but it being understood that the Government will keep the boat in good order and repair, keep it fully insured and return it to me at the close of the war in as good condition as it now is.

Respectfully,

Albert C. Burrage."

War Relief Funds.—On May 19 the totals of the principal New England war relief funds reached the following amounts:

Belgian Fund	$604,767.92
French Wounded Fund	226,920.64
Marshal Joffre Fund	224,260.00
Armenian Fund	182,999.05
Serbian Fund	119,794.66
Permanent Blind Fund	113,944.65
British Imperial Fund	99,140.00
Surgical Dressings Fund	88,946.97
Boston Ambulance Fund	83,691.48
Polish Fund	73,512.28
Metropolitan Red Cross Fund	60,614.82
Italian Fund	41,165.77
French Phthisis Fund	13,999.04
LaFayette Fund	13,310.00
Russian Refugees' Fund	2,465.48
American Volunteers' Fund	1,325.53

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Saturday, May 19, 1917, the number of deaths reported was 252, against 227 last year, with a rate of 17.01 against 15.57 last year. There were 45 deaths under one year of age, against 33 last year, and 63 over 60 years of age, against 62 last year.

The number of cases of principal reportable diseases were: diphtheria, 98; scarlet fever, 41; measles, 227; whooping cough, 26; typhoid fever, 1; tuberculosis, 51.

Included in the above were the following cases of non-residents: diphtheria, 18; scarlet fever, 9; measles, 1; whooping cough, 1; typhoid fever 1; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 12; scarlet fever, 1; measles, 3; tuberculosis, 19.

Included in the non-residents were the following deaths: diphtheria, 3; measles, 1; scarlet fever, 1; tuberculosis, 2.

Anthrax in Malden.—A worker in a brush factory in Malden has been found to be suffering from anthrax. He is at present in the Frost Hospital, Chelsea.

Boston City Hospital Alumni Association.—The annual meeting of the Boston City Hospital Alumni Association was held in this city on April 11. In the forenoon a series of papers was presented and operations were performed in the surgical amphitheatre of the hospital. Luncheon was served at 1 p.m., and in the evening the annual dinner was held at the Copley-Plaza Hotel. Dr. E. G. Brackett presided at the dinner, and there were addresses by Drs. E. H. Nichols, J. G. Blake, J. H. Courtney, R. I. Lee and W. I. Bullard. Dr. George H. Washburn of Boston was elected president; Dr. Herbert L. Smith of Nashua, N. H., vice-president; Dr. W. R. P. Emerson of Boston, treasurer; and Dr. Cadis Phipps of Boston, secretary, for the ensuing year.

Springfield Academy of Medicine.—The annual meeting of the Academy was held at 137½ State Street, Springfield, on Tuesday, April 10, 1917. Officers were elected for 1917-18. Dr. Edward Martin of Philadelphia addressed the meeting on "A Story of Some Fractures of the Femur." The following amendment to the by-laws was voted upon: Article V to read as follows: "Annual dues shall be such as shall be voted annually by the Academy. The fiscal year shall end on March 31 of each year. The president shall appoint each year, on or before March 1, an auditing committee to audit the treasurer's accounts and submit its report at the annual meeting."

ROBINSON MATERNITY BUILDING.—The maternity department of the Massachusetts Homeopathic Hospital, known as the Robinson Maternity, has been in operation a little more than a year, and has been filled to capacity almost since its opening. During 1916 it cared for 1564 mothers, and 1359 babies were born under its roof. The suites of rooms with bath and balcony, where the patient may have her own physician, are so popular that the demand has exceeded the supply, and the applications for general ward accommodations, comprising those who are received free and those who barely pay cost expenses, has been so far beyond the present capacity of eighty beds, that adjoining property has been secured for future expansion. About $300,000 are needed for this enlargement, and the hospital looks confidently to a generous public to supply the means for meeting the needs of this department of hospital work.

BABY HYGIENE ASSOCIATION.—The eighth annual public meeting of the Baby Hygiene Association was held recently at the Copley-Plaza, Boston. Dr. John Lovett Morse presided and presented the following statistics for the past year. He stated that the Association during that time had taken care of 5000 babies, or about 25% of the 20,000 babies born. He also called attention to the decreasing importance attached to the question of milk, as compared with the necessity of training mothers. More than half of the babies brought to the stations are breast-fed. Last year the nurses paid 67,000 visits. Three nurses were awarded diplomas by the Association for their work. John F. Moors, president of the Associated Charities, spoke appreciatively of the educational value of the Association.

BOSTON LYING-IN HOSPITAL.—The recently published report of the 84th year of the Boston Lying-in Hospital covers the work of that institution for the year 1916. A total number of 819 mothers and 783 babies have been cared for in the hospital. The out-patient department has cared for 1632 mothers and 1624 babies. The decrease in the number of cases, both in the Hospital and in the Out-Patient Department, is regarded as due to the lack of immigration and to the return to home countries for military service of many reservists. It is also to be noted that the material prosperity of all wage-earners during the past year has resulted in fewer applications for charitable care of the wives during their confinement. Only about one-half as many pauper cases were sent in to the Hospital by the Overseers of the Poor. In the out-patient department there was a decrease of 16% in the number of free cases attended. The work of the Pregnancy Clinic is thoroughly organized. The new South End Clinic, which was opened on January 22, records about 2,200 visits for the period of a little over eleven months. The year has seen the inauguration of the Medico-Social Department in connection with the Out-Patient and Pregnancy Clinic, and two workers are now engaged in this service. Their success has amply proved the desirability of the experiment. The committee on raising funds for the new building reports that in March, 1917, they had obtained $364,552.86.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT MEDICAL SOCIETIES.

WORCESTER DISTRICT MEDICAL SOCIETY.—The annual meeting of the Worcester District Medical Society was held at the State Mutual Restaurant, Worcester, Wednesday evening, May 9th. About 80 members were present at dinner, after which the reports of officers and committees were heard and acted upon and officers for the ensuing year were elected as follows:

President, Dr. Michael F. Fallon, Worcester; vice-president, Dr. W. L. Johnson, Uxbridge; secretary, Dr. E. L. Hunt, Worcester; treasurer, Dr. George O. Ward, Worcester; orator, Dr. R. P. Watkins, Worcester.

Then followed the oration by Dr. William L. Johnson, of Uxbridge, on the subject: "A Physician's Impressions of Florida."* The orator received an ovation as an acknowledgment of his valuable services to the cause of legitimate medicine in the Massachusetts Legislature during the present session of that body.

Addresses by Dr. Samuel Bayard Woodward, president of the Massachusetts Medical Society, and by Dr. Walter Prentice Bowers, his predecessor in that office, followed. The remarks of both these gentlemen were received with an enthusiasm which left no room for doubt as to the pride of the members of their home society in their official achievements.

The retiring president, Dr. George O. Ward, then presented his successor with the following graceful tribute:

"There remains for me one more duty, by no means the least important, the induction of my successor into office. I am sure he needs no introduction. His good name and high professional standing are well known beyond our small borders. In our city, you know, he has the entire respect both of our profession and the public. His service to our society, outside our immediate circle, has deserved our gratitude, and it gives me great pleasure to relinquish this chair to Dr. Michael Francis Fallon, Surgeon-in-Chief to St. Vincent's Hospital."

Dr. Fallon responded briefly, accepting the office, thanking the society for the honor bestowed and promising his earnest effort in all the duties pertaining to his office. At his request all sang the "Battle Hymn of the Republic," and the meeting adjourned.

ERNEST L. HUNT, M.D., *Secretary.*

* This address will be published in a later issue of the JOURNAL.

Obituary.

HERBERT S. GAY, M.D.

Dr. Herbert S. Gay, a well-known Boston physician, died suddenly of pneumonia, at his home, on April 21, 1917. He was born at Springfield in 1871, the son of Edward and Mariette Gay. He received his early education at the Westfield Normal School, and from there entered Harvard Medical School, from which he graduated in 1901. During his course at the Medical School he taught school at Dedham, Cambridge and East Boston. Before beginning practice he served as house officer at the Carney Hospital and at the Boston Lying-in Hospital. He later served on the staff of the Boston Dispensary and the Mt. Sinai Hospital, and at the time of his death was on the staff of the Dispensary for Women. He had been an instructor for several years at the Tufts Medical School.

Dr. Gay was a member of the American Medical Association, Massachusetts Medical Society, and the Boston Medical Library Association.

He is survived by his widow and an infant daughter.

Correspondence.

A FURTHER EXPOSITION OF THE ABDUCTION TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR.

New York City, April 4, 1917.

Mr. Editor:—

I had inferred from Dr. Cotton's letter that the presentation of x-ray pictures in support of "alleged data" might be a basis for further discussion. His retirement from the field leaves certain loose ends which I wish to gather up in order to complete the argument for efficient treatment.

The abduction treatment is a systematic application of surgical principles to all varieties of fracture of the neck of the femur. The name of the method was chosen from its most salient feature, the fixation of the limb at the limit of normal, individual abduction (40° to 60°).

The persistent advocacy of this treatment during the past fifteen years has made the name familiar, and the position of abduction has been adopted by many surgeons who do not employ the abduction method. Ruth, for example, has informed me that he has thus modified the Maxwell method.

The position of abduction is not the abduction treatment, and the statement to be found in Dr. Cotton's book, that "union usually occurs in fractures originally unimpacted by the use of the abduction treatment" is an unqualified indorsement of the abduction treatment, whatever may have been his conception of it at that time.

In his letter, Dr. Cotton makes the somewhat cryptic statement that "abduction did not wait for Whitman to make itself heard or practised," and in a recent paper, published in the *Annals of Surgery*, he suggests that the abduction treatment developed on "lines laid down by Shaffer," because Shaffer had reported a case of ununited fracture of the neck of the femur treated successfully by a Taylor traction hip brace, combined with a surcingle for pressure on the trochanter. The brace, in adaptation to the contractions, was applied in 45° of flexion and 20° of abduction.

In another treatise on fractures the statement is made that, since traction on the limb tilts the pelvis downward, a relation of abduction is thereby established by routine treatment, so like that of the abduction method "that the difference is only imaginary."

I doubt if Cotton would agree with Stimson, but the quotations will illustrate two of the several misconceptions of the abduction method.

There is another minor point in the mechanics of the method which has been questioned. In his letter, Dr. Cotton said that I classed leverage on the acetabular rim with capsular tension as a means of locking the fragments. It has since occurred to me that by leverage, which is used only as a means of reducing resistant deformity, he meant contact of the trochanter with the pelvis.

In the exposition of the anatomical basis of the method it has been stated that as the limb is abducted, the head of the femur descends in the acetabulum and emerges below it, the movement being finally checked by capsular tension and by contact of the outer border of the neck and trochanter with the rim of the acetabulum and side of the pelvis. This is true of the average or normal subject.

If the neck is abnormally long, or if its elevation is excessive (coxa valga), or if it is depressed (coxa vara) so that abduction is directly checked by the deformity, contact cannot be established. If, on the other hand, the neck is shortened, as, for example, by the crushing of an effective artificial impaction, contact of the trochanter with the margin of the acetabulum will limit the range of abduction, which, if forced, would separate the fragments.

This anatomical observation may be verified:

a. In the dissecting room, if the condition of the joint permits free movement, providing, of course, that the intervening soft parts have not been removed.

b. By x-ray pictures, one of which is presented.

c. By tests on paralyzed limbs (anterior poliomyelitis), in which atrophy and absence of muscular resistance permits direct palpation.

d. By inspection at open operations, most of which, the neck having been shortened by injury or disease, demonstrate the limitation of abduction due to contact of the trochanter and acetabular rim.

Attention is called to this point, because it has been questioned by others than Cotton. Stimson was unable in any specimen examined to bring the trochanter "within an inch of such contact;" by Moore, also, who has, however, reduced the interval to half an inch.

On the other hand, the only experimental work on the abduction method is that of Dr. A. S. Taylor, Professor of Operative Surgery in the Cornell Medical School (*Am. Jour. Med. Sciences*, May, 1905). Taylor's conclusions are as follows:

"Abduction was limited:

"*a.* By the inferior ligaments and capsule.

"*b.* Impact of the posterior part of the trochanter on the soft tissues just above the acetabulum.

"Both of the obstructions seemed to occur simultaneously. Tension of the inferior capsule and its ligaments tended to cause spontaneous alignment of the fragments. The influence was more marked as the line of division approached the trochanter."

I have spoken of such contact as of minor importance because it is but one of the factors upon which security depends, the others being:

a. The direct mutual pressure of the apposed fractured surfaces assured by the horizontal position of the neck and capsular tension in complete abduction.

b. In epiphyseal fractures, and in some of those of the intra-capsular type, the base fragment may be inserted beneath the rim of the acetabulum, as illustrated in Figure 1 of my last letter.

c. In complete abduction the muscles are powerless as agents of deformity.

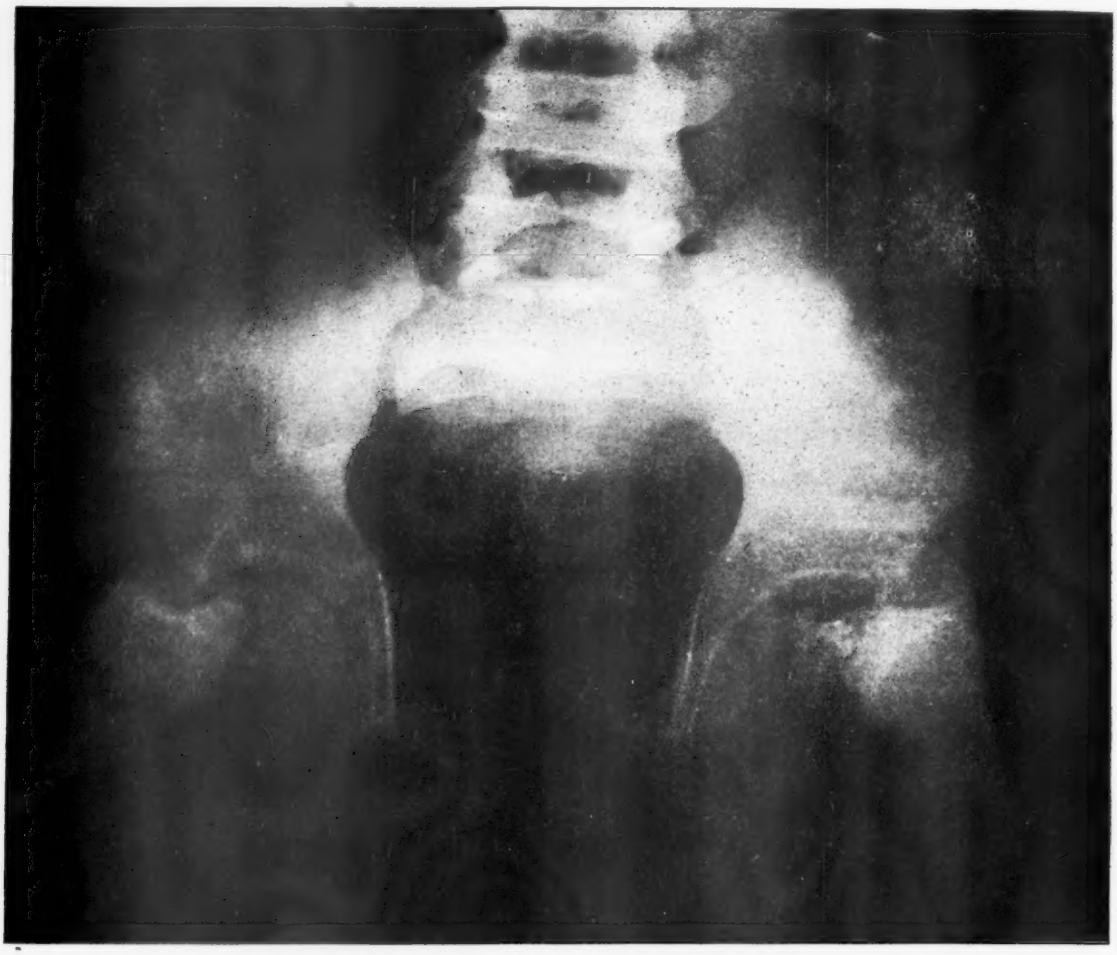

FIG. 1. Showing the contact of the trochanter and pelvis at the limit of normal abduction on the right side, and the direct limitation of abduction due to a shortened and depressed femoral neck on the left.

d. A plaster spica applied in complete abduction and hyperextension is an efficient support.

It is my contention that conventional practice is based upon inadequate mechanics. This inadequacy compels the disregard of surgical principles. It excuses inefficiency and neglect, and it is the most reasonable explanation for the extraordinary percentage of failures, even in cases of the most favorable class. It is supported by a doctrine of despair which makes progress impossible, as may be demonstrated by comparing a typical chapter on fracture of the neck of the femur of to-day, with one written fifty years ago.

The abduction treatment represents a higher standard of purpose and achievement because it is based on surgical principles. When, therefore, a qualified expert of the standing of Dr. Cotton states that it is unnecessary to apply the method properly, and who doubts its mechanical efficiency, it seems to me that I am justified in the interest of the cause that I represent, in analyzing the basis of his conclusions as it is presented in his writings.

This analysis shows Dr. Cotton to be a thoroughgoing conservative, upholding chance rather than technical skill as the determining factor in the result, the chance of the exact situation of the fracture as intra- or extra-capsular, and the chance of impaction or non-impaction. He believes that impaction is the only assurance of repair; therefore, it "is a crime to disturb it," unless the deformity is extreme, and in complete intra-capsular fracture it should be produced artificially, since otherwise non-union is inevitable.

It is evident that artificial impaction cannot improve nutrition, consequently it can serve only to fix the fragments in apposition. If, then, routine treatment is absolutely inadequate to assure this essential in one type of injury, it must be relativeiy inadequate for all and should be discarded.

Dr. Cotton does not reach this logical conclusion because he has no interest in the treatment of other forms of fracture "which do not do badly under any form of handling," although the report of the British Committee classified the results as good in but 23% of those actually treated. In other words, he accepts the present standard and emphasizes the futility of

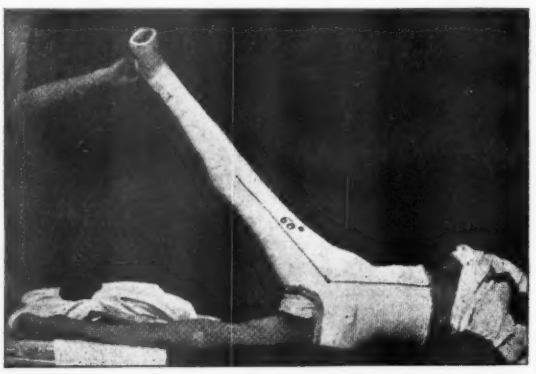

FIG. 2. Fixation of the limb in full abduction and extension by a long plaster spica.

conventional treatment only as an argument for artificial impaction. He does not understand the mechanics of the abduction method, and apparently his only experience with it is as a supplement to artificial impaction, which, by shortening of the neck, makes full abduction impossible.

Maxwell, to whom Dr. Cotton refers with apparent approval, styled his treatment as one for intra-capsular fracture and claimed success in every case, or, as his associate, Ruth, states it, "bony union in every case if the patient survives four weeks."

It is true that Maxwell had no x-rays at his disposal, but neither had Sir Astley Cooper, who considered these cases hopeless and, therefore, simply supported the limb on a pillow for a few weeks, while Maxwell treated them by the only traction method that, from the mechanical standpoint, deserves serious consideration.

It is quite possible, therefore, that the conclusions of each reflected the quality of the treatment, just as the differences between Dr. Cotton and myself, in a more comprehensive sense, are capable of the same explanation.

The abduction treatment, as an exact method, applied with a definite purpose, calls for a higher standard of technical skill and experience in applying and adapting it to the character of the fracture, and to the quality of the patient, than has hitherto been at the command of this neglected injury. It has been placed at a further disadvantage by the misconceptions of the representatives of authority, but it has made steady progress.

In the volume on fractures of the *Nouveau Traité de Chirurgie* it is stated that "Cette méthode préconisée par Whitman est à l'heure actuelle partout appliquée." In other words, that it has come into general use. According to my observation, however, about all that is known of it is that the limb is fixed in abduction, which is the final step in the process, the order being:

a. Complete reduction of shortening, under anesthesia, by manual traction, the trochanter being lifted and guided to its proper place.

b. Correction and over-correction of the outward rotation.

c. Abduction of the extended limb to the normal individual limit, as indicated by the range on the sound side.

d. Fixation in full abduction and hyper-extension by a plaster spica, extending from the axillary line to the ends of the toes.

It may be noted that the limb is not abducted until after the fragments are adjusted.

The great majority of so-called impactions may be easily reduced by this manipulation, but in the resistant types, more common in early life, a certain degree of leverage will be required as illustrated in my last letter.

Deformity is always corrected in order to restore function and because repair should be favored by a more accurate adjustment of the fractured surfaces.

It will appear, therefore, that fracture of the neck of the femur may now be treated like other fractures, and, in my opinion, the result is more directly determined by the character of this treatment and by the experience and skill of the one who applies it than is that of any other injury of its class.

Dr. Cotton admits "that the welfare of hundreds of patients is involved in this problem," and I conclude, therefore, that two hardened controversialists like ourselves are not likely to think the worse of each other because of the manner in which honest convictions have been expressed. In fact, I feel under obligations to him for the opportunity to present the abduction treatment to the readers of the JOURNAL, particularly to my former colleagues in Boston.

ROYAL WHITMAN.

283 Lexington Avenue.

NOTICES.

UNITED STATES CIVIL-SERVICE EXAMINATIONS.

MEDICAL INTERNE, ST. ELIZABETH'S HOSPITAL.

June 6, 1917.

The United States Civil Service Commission announces an open competitive examination for medical interne, for both men and women, on June 6, 1917. A vacancy in St. Elizabeth's Hospital, Washington, D.C., at $900 a year, with maintenance, and future vacancies requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

Male eligibles are desired for the existing vacancy.

The positions are tenable for one year, and pay $75 a month and maintenance. During the year, however, a postgraduate course in mental and neurological diagnostic methods is given, an examination is held, and promotions to the next grade, junior assistant physician, are made. Beyond this there is regular advancement for men whose services are satisfactory. St. Elizabeth's Hospital has over 3,000 patients and about 800 employees to care for. In addition to the general medical practice offered, the scientific opportunities in neurology and psychiatry are unsurpassed.

Applicants must show that they are graduates of a reputable medical college or that they are senior students in suc han institution and expect to graduate within six months from the date of this examination. The names of senior students will not be certified for appointment in the event they attain eligibility in the examination until they have furnished proof of actual graduation.

Applicants must not have graduated previous to the year 1915 unless they have been continuously engaged in hospital, laboratory, or research work along the lines of neurology or psychiatry since graduation, which fact must be specifically shown in the application.

Applicants must be unmarried.

Age, 20 years or over on the date of the examination.

No sample questions of this examination will be furnished.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D.C. Applications should be properly executed, excluding the medical and county officers' certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination as given at the head of this announcement should be stated in the application.

JUNIOR ZOÖLOGIST (MALE).

June 6, 1917.

The United States Civil Service Commission announces an open competitive examination for junior zoölogist, for men only, on June 6, 1917. A vacancy in the Bureau of Animal Industry, Department of Agriculture, Washington, D. C., at a salary ranging from $1,400 to $1,800 a year, and future vacancies requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy py reinstatement, transfer or promotion.

The duties of the position will consist of laboratory

and field work in the investigation of animal parasites and routine work carried on in the Zoölogical Division of the Bureau of Animal Industry.

The prerequisites for consideration for this position are: Graduation from a college, university, medical college, or veterinary college of recognized standing in a course including at least two years' work in a biological laboratory, or the fact that the applicant is a senior student in such a course and institution and expects to graduate within six months from the date of this examination; or, for persons lacking a full college course as above described, graduation from a four years' high-school course or four full years of study in a school offering a course equivalent to that of a high school, and at least one year's experience in biological investigations for each year lacking of such college course. The names of senior students who pass the examination will not be certified for appointment until they have furnished proof of actual graduation.

Competitors must attain an average of at least 70 per cent. in the subject of practical questions.

Statements as to education, training, and experience are accepted, subject to verification.

Under the subject "thesis" the competitor may submit, in lieu of or in addition to a thesis on a zoological subject, any formal reports or publications of which he is the author or co-author. Unless a thesis is submitted the reports or publications must relate to some zoölogical subject. The material submitted must be accompanied under oath, taken before an officer authorized to administer oaths for general purposes, in the following language: "I, the undersigned, do solemnly swear (or affirm) that in the preparation of the accompanying material the composition is entirely my own, and that I have given full credit by quotation marks or references to authorities for any quoted matter." The examination number given the competitor at the commencement of the examination should be written on the material before it is handed to the examiner.

Applicants must not have reached their forty-fifth birthday on the date of the examination.

Applicants may be examined at any place at which this examination is held, regardless of their place of residence; but those desiring permanent appointment to the apportioned service in Washington, D. C., must be examined in the state or territory in which they reside and have been actually domiciled in such state or territory for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D.C. Applications should be properly executed, excluding the medical certificate, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination as given at the head of this announcement should be stated in the application form.

RESIGNATIONS.

The following members of the medical faculty and instructing staff of Columbia University have resigned: Dr. George E. Brewer, professor of surgery; Dr. Virgil P. Gibney, professor of orthopedic surgery; Dr. Herman Von W. Schulte, associate professor of anatomy; and Dr. Homer Fordyce Swift, associate professor of medicine.

Dr. Charles P. Bancroft, for thirty-five years superintendent of the New Hampshire State Hospital, has resigned from that position, his resignation to take effect July 1.

RECENT DEATHS.

FRANCIS HENRY BROWN, M.D., died at the City Hospital, Boston, as the result of a street car accident, May 16, 1917, aged 81 years.

CHARLES E. SIMMONS, M.D., a well-known New York physician, died at his home in that city on May 3, 1917. Dr. Simmons was born in Troy, N. Y., and was graduated from Williams College in 1860. He studied then at Göttingen University, from which he was graduated in 1862. Upon his return to this country he attended the College of Physicians and Surgeons of Columbia University, from which he was graduated in 1864. For the next four years he practised in his native city, but then moved to New York and continued there in practice until the time of his death. Dr. Simmons was, for more than thirty years, active in Democratic politics.

LOUIS JOSEPH LANDOUZY, M.D., dean of the faculty of medicine of the University of Paris, has recently died. He was born at Rheims, and both his father and grandfather were physicians. He was a member of a number of societies, and had written many valued works on medical subjects.

ALBERT CLARENCE LANE, M.D., a retired Fellow of the Massachusetts Medical Society, living in Woburn, died at the Massachusetts General Hospital, Boston, February 1, aged 65 years, following an operation for appendicitis. He was a graduate of the Long Island College Hospital in 1879, and was retired in June, 1916.

HERBERT W. CONN of Middletown, Conn., a well-known bacteriologist, died at his home, on April 18, 1917. He was born in Fitchburg in 1859 and was graduated from Boston University in 1881. For some years he had been state bacteriologist of Connecticut and professor at Wesleyan University. He was president of the American Association of Bacteriologists and had written a number of books on bacteriology.

DR. LAURENCE L. PIERCE, chairman of the Board of Health of Arlington, Mass., died at his home, on April 27. Dr. Pierce was born in Arlington in 1876. He entered Harvard College and studied veterinary surgery, graduating in the class of 1898. He established himself in practice in his native town and was very successful. For many years he had served on the Board of Health, and for the greater part of the time was its chairman. He is survived by his widow and three sons.

NATHANIEL CLARK BACON HAVILAND, M.D., died at Worcester, April 22, aged 63 years. He was a graduate of the University of Vermont Medical School in the class of 1878, and had practised in Holliston and Worcester since 1899, when he joined the Massachusetts Medical Society.

J. EDWARD HOOLE, M.D., of Somerville, Mass., died suddenly at his home on February 15. Dr. Hoole was born in Lowell in 1869, and was graduated from the College of Physicians and Surgeons at Baltimore, in 1903. Since that time he had practised his profession in Somerville. He is survived by his widow and one daughter.

SIR FREDRICK WILLIAM BORDEN, M.D., who died on January 6 at Canning, N.S., was born at Cornwallis, N. S., in 1847. A physician by profession, he served for many years as a British army surgeon. From 1896 to 1911 he was minister of militia and defense in the Laurier cabinet, and was knighted for his efficiency in the organization of the Canadian troops who fought during the Boer War in South Africa.